AMERICAN JOURNAL OF OPTOMETRY
and ARCHIVES *of*
AMERICAN ACADEMY OF OPTOMETRY

Volume 27

1950

AMERICAN ACADEMY OF OPTOMETRY

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[see page 36]

AMERICAN JOURNAL OF OPTOMETRY
and ARCHIVES *of*
AMERICAN ACADEMY OF OPTOMETRY

Vol. 27 JANUARY, 1950 No. 1

BALANCING VISUAL STIMULI IN ORTHOPTIC TRAINING*

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It is generally accepted that stereopsis and binocular depth perception are, to a large extent, dependent upon equal sensitivity of the two eyes. When equal visibility is lacking, the ability to judge depth is disturbed and percentile stereopsis is reduced. The intensity level of the binocular stimulus, or the visibility-level of the object of regard, is of lesser importance for the ordinary seeing conditions where near-threshold visibility usually is not encountered.[1] Furthermore, clinical experience has shown that the balancing of stimuli before the two eyes is an important factor in the efficient functioning of the entire binocular mechanism. It follows, therefore, that adequate control of those factors which lead to the proper balance of stimuli is of fundamental importance in procedures which seek to effect single simultaneous binocularity.[2]

While various methods have been devised for balancing the visibility of orthoptic test-objects, that most commonly used is to control the target illumination. It is general practice to decrease the illumination before the better eye or to increase it before the eye of lower acuity by means of rheostats until a fair balance has been established. While it is true that this method lends itself readily to conventional clinical procedures, nevertheless it involves several inherent disadvantages of a theoretical and practical nature which strictly limit its effectiveness. For example, large changes in illumination are required to produce relatively small changes in visual acuity. Thus, it frequently becomes necessary to use extremely low levels of illumination in order to obtain the neces-

*Submitted on October 11, 1949, for publication in the January, 1950, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.
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sary reduction in visibility. These low levels of illumination in turn produce concomitant changes in the size of the pupil and in the state of retinal adaptation. The latter may even result in a transition from cone to rod vision. It seems reasonable to assume that the introduction of such physiological variables in the orthoptic problem is undesirable. In addition to these physiological objections to altering visibility by attempting to provide adequate ranges of illumination, certain practical difficulties such as the prevention of stray light and the availability of only restricted ranges in illumination may be encountered. This is particularly true when orthoptic training is carried on in the home. In recent years, home training methods have been devised which should, theoretically, produce results. However, these results have not been forthcoming, primarily because adequate means of controlling visibility by changes in target illumination have been lacking.

Most of these difficulties may be eliminated, or at least be minimized, by controlling visibility through simultaneous changes in both brightness and contrast. In this manner, large changes in visibility may be obtained with relatively small changes in illumination. The adaptation of this method binocularly to the rotoscope and to a supplementary technique of refraction has been described in previous papers.[3, 4] In the present paper a simpler single element is described which may be applied to various orthoptic instruments.

APPARATUS

The clinical apparatus consists essentially of a circular colorless filter with a precise gradient of density which may be placed before one of the apertures of the orthoptic instrument and adjusted to any desired angular position. This gradient filter not only reduces by absorption the apparent brightness of the visual field as seen by the eye before which it is placed, but also lowers the contrast between the object of regard and its background due to the slightly diffusing characteristics of the photographic filter. This slight diffusion produces the effect of a veiling brightness over the field of view which obviously reduces the contrast between the object and its background. It has been shown elsewhere[5] that contrast is the more effective of these two factors in altering the visibility of the object of regard.

A practical form of this device is illustrated in Figure 1. The form shown is adapted particularly for attachment to a hand stereoscope. The U-shaped clip, which fits over the septum, holds the circular gradient before the eye as is illustrated in Figure 2. The visibility of the target may be increased or decreased by rotating the gradient. Modified

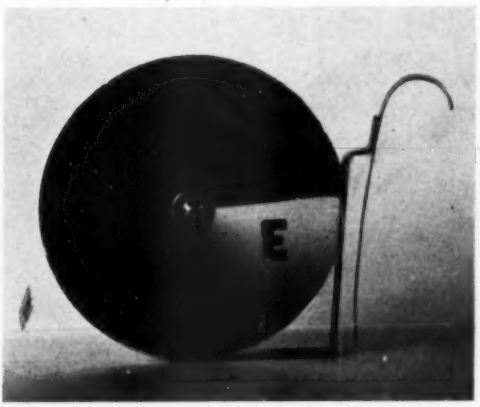

Fig. 1. The Luckiesh-Moss Visibility-Control as adapted for use with the hand stereoscope. The clip fits over the septum of the stereoscope.

clips and holders have been designed for other orthoptic instruments such as the rotoscope, stereo-orthorater, telebinocular, etc., as is illustrated in Figure 3.

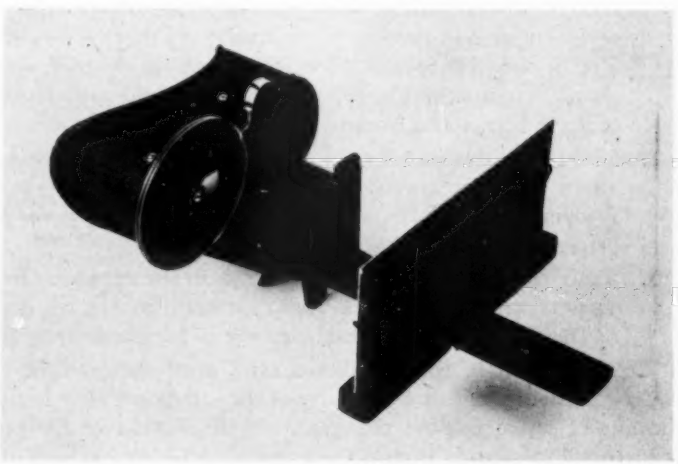

Fig. 2. Illustrating how the Luckiesh-Moss Visibility-Control is mounted on the hand stereoscope.

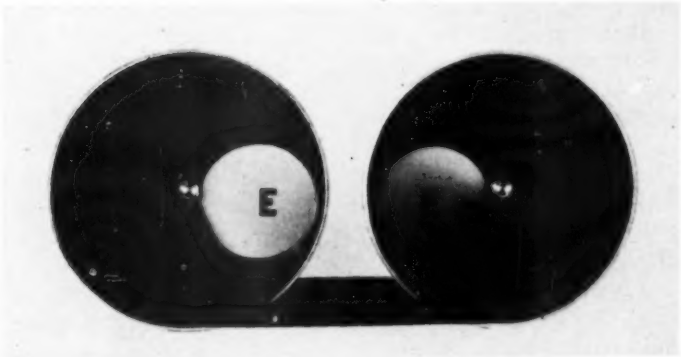

Fig. 3. A binocular Luckiesh-Moss Visibility-Control equipped with a holder for mounting on the rotoscope.

TECHNIQUE

The following technique has been used extensively in clinical practice by one of the authors, and has proved to be effective in obtaining single binocular vision in many cases which failed to respond to other methods of control.

1. The angular deviation having been approximated and corrected (Duane) two dissimilar targets of equal brightness are exposed to the patient. Suppression of the object before the squinting or non-dominant eye usually follows. The circular filter is then interposed before the dominant eye and rotated slowly (approaching absolute threshold) until suppression of that eye occurs and fixation is transferred.
2. Slight adjustments are then made in one of the following to attain binocular vision: (a) the size of the targets; (b) the amounts of prismatic power; or (c) the density of the filter before the dominant eye.
3. Training is then conducted in the ordinary manner. As the visual efficiency of the non-dominant eye increases, the density of the filter before the dominant eye is progressively reduced.

The filter used in the visibility-control is of the gradient type. Therefore, it is obvious that the density of the interposed filter is altered as the line of visual fixation changes with the motion of the target. This effect is illustrated in Figure 3 where a black object has been placed directly behind the gradient filter. The lower portion of the filter seen through the aperture is denser than the upper portion. Thus the

lower part of the object is less visible than the upper part.

Clinical experience indicates that this characteristic of variable visibility is a favorable one. For example, in cases involving extremely low visual acuity and a correspondingly dense filter for equalizing the visibility of the two targets, it has been observed that the target before the dominant eye will occasionally disappear as the line of regard changes. This is due to the fact that the line of vision passes through different portions of the gradient filter while fixating various parts of the target. Thus the advantages of the "make and break" method of treatment are obtained without the necessity of prismatic adjustment.

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ABSTRACTS

AN ELECTRICAL REMOTE CONTROL FOR THE REVOLVING ASTIGMATIC CROSS. Horace L. Weston, (Detroit, Mich.), Am. J. Ophth. 32 (9). 1272, September, 1949.

The author has devised an electrical remote control to replace the inconvenient hand adjustment of the revolving astigmatic cross. The apparatus consists of a gear box and a reversing motor, synchronized with a control-box dial by a pair of selsyn motors which operate efficiently on either 115V-400 cycle, A.C., or 24V-60 cycle, A.C., such as found in furnace control transformers.

Push button switches on top of the box containing the control unit, operate the primary circuit and the muscle light. To prevent hum, the former is used only when dial is rotating. The mounting for the latter, and a driving generator, are behind the face of the box.

The author uses reverse charts with a mirror, but an 8-wire radio battery cable, leading from the control box to the chart box, may be lengthened and two of the control wires reversed to turn generators in opposite directions for 20-foot operation.

R. E. B.

TONICITY INDUCED BY FUSIONAL MOVEMENTS*§

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INTRODUCTION

Two important points regarding the course of fusional movements need to be emphasized. The first is concerned with fusional movements in repeated tests, and the second, with the gradual disappearance of the fusional innervation after the stimuli which induced the movements have been removed.

When repeated tests of a fusional amplitude are made, the limit of the fusional movement becomes further extended. This effect was first pointed out by E. Hering in 1868.[1] He had observed that single vision through prisms of relatively strong power could be secured and maintained only after repeated measurements of the fusional amplitude. Later, this effect was extensively studied by Hoffmann and Bielschowsky.[2] They verified an observation of Hering that fusional movements take place much more slowly and with greater difficulty than the voluntary movements of the eyes and within relatively narrow limits. Because these movements are relatively slow a discrepancy in the form of a lag in the eye movements behind the test stimuli is usually found. This varies with the individual and test conditions. The lag was found to be greater the nearer the eyes came to the limit of the fusional amplitude.[3]

Hofmann and Bielschowsky further found that the tonic innervations resulting from fusional movements do not disappear immediately after the disparate retinal images which induced the movement have been removed. At first the rate of disappearance is high but it gradually decreases. Because of this, a small residue of tonic innervation can be demonstrated for some time after the test. This residue is higher the longer and the greater the fusional innervation has existed. Although a new compulsion to fusion such as making the eyes fuse for a short while on an object seen by the two eyes without prisms will accelerate its disappearance, it will not abolish it entirely; on the contrary, a

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*Read before the annual meeting of the American Academy of Optometry, Cleveland, Ohio, December 11, 1949. For publication in the January, 1950, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.

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§This investigation was made possible by a grant-in-aid for research in physiological optics by the Univis Lens Company.

residue of the original innervation will appear repeatedly whenever the eyes are dissociated.[4] This is particularly well illustrated by the results of an experiment in which the eyes were forced into a position of maximum vertical divergence and then permitted to gaze around a room for five minutes.[5] Then the extent of the maximum vertical divergence was again measured and the rest period repeated. The vertical phoria was measured just prior to and following each repeated test of the maximum vertical divergence in a given deviation. A graphical illustration of the results of the experiment are given in Figure 1. In this figure, the

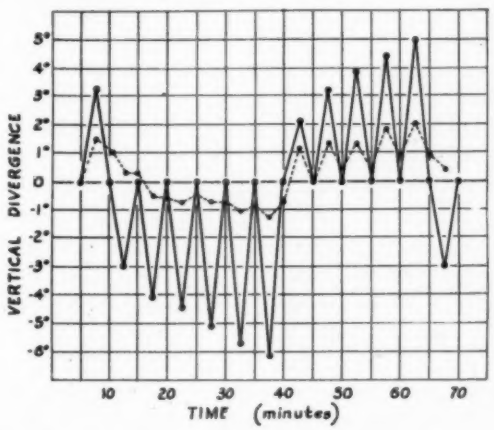

Fig. 1. Illustration of the effect of residual tonic innervation resulting from vertical divergence on the relative position of rest of the eyes. The broken lines indicate the phoria positions, and the solid lines the vertical divergence of the eyes at different times during the experiment (Hofmann and Bielschowsky).

ordinate represents the vertical displacement of the targets about the eyes in degrees, and the abscissa gives the time in minutes. The broken lines indicate the phoria positions while the solid lines illustrate the amount of vertical divergence induced by the test conditions. It should be noted that as the maximal vertical divergence in one direction increased as a result of repeated tests, the limit of vertical divergence in the opposite direction was diminished.

That the tonic innervation which is induced by a test for positive or negative vertical divergence does not subside immediately after its completion was also demonstrated by Ellerbrock.[6] He measured the extent of positive and negative vertical divergence by means of rotary prisms which were mounted in front of the eyes. The sequence of the tests was as follows:[7]

Sequence		*Test*		*Divergence Movement Induced*
1	Base-up	O.S.	to break	Positive vertical
2	Base-down	O.S.	to break	Negative vertical
3	Base-up	O.D.	to break	Negative vertical
4	Base-down	O.D.	to break	Positive vertical

Although the base-down O.S., and base-up O.D. break tests both forced the eyes to use maximum negative vertical divergence to maintain binocular fixation to the break point they were not equal.[8] This is shown in Figure 2A in which the base-up O.D. break findings are

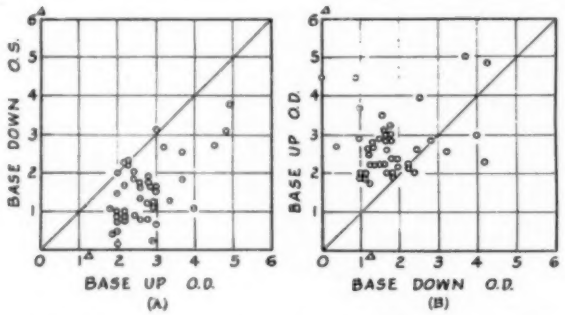

Fig. 2. (A) Correlation of the amplitudes of negative vertical divergence as determined by base-down prism to break for the left eye and base-up prism to break for the right eye. (B) Correlation of the amplitude of negative vertical divergence with positive vertical divergence. The tests for the measurements of the amplitudes were made consecutively.

shown to be larger than the base-down O.S. findings. This indicates that the base-down O.S. break test was obviously affected by the tonic innervations resulting from the base-up O.S. test, and helped to neutralize this disturbance, so that the succeeding test was not affected. The base-up O.S. test might have even created a shift toward right hyperphoria which would have augmented the base-down O.D. finding.

Since the base-up O.D. break test was followed by the base-down O.D. test; (i.e., a test requiring negative vertical divergence was followed by a test requiring positive vertical divergence) it might be expected that the base-down O.D. findings would be lowered because of the disturbance set up by the base-up O.D. test. Figure 2B illustrates this effect. The base-up O.D. finding is definitely the greater in a very large percentage of the cases.[9]

When the eyes are maintained in a position of maximum vertical

divergence for a period of time Herzau found that the residual tonic innervation following the completion of the experiment will be demonstrable for hours and even the next day.[10] This finding confirmed that of Hofmann and Bielschowsky regarding the persistence of the tonic innervation which positioned the eyes in one direction even after the operation of the fusional mechanism in the opposite direction.

The effect of the measurement of positive and negative fusional convergence at distance on the horizontal near phoria measurements was demonstrated by Alpern.[11] He found that the innervation for maximal positive fusional movements prior to a near phoria measurement caused an erroneous reading in the subsequent phoria measurement in the direction of esophoria.[12] Morgan investigated the problem to determine whether or not the visual lines return to the phoria position after the measurement of positive and negative fusional convergence.[13] The essential result of his experiments was that the measurement of the amplitude of positive fusional convergence two or three times in succession caused a definite trend for the position of rest to be more towards overconvergence than the true phoria position. On the other hand, if the amplitude of negative fusional convergence was measured two or three times consecutively, this position tended more toward insufficiency of convergency.[14] Morgan also noted that this tendency for a change in the direction of the visual lines after repeated stimulation of either positive or negative fusional convergence persisted for only short intervals of time. Careful measurements failed to disclose any lag after 30 minutes following as many as 50 repeated measurements of either positive or negative fusional convergence.[15]

When the eyes undergo fusional movements in response to disparate images the tone of the extraocular muscles is altered so that like images are brought as nearly as possible on corresponding retinal points. As soon as this position of the eyes is reached, it forms the basis on which the movements of both eyes are made. This characteristic of the fusional movements was recognized by Hering as early as 1868. Later (1920-1925) Hofmann emphasized that the important factor concerning fusional movements is not the movement that leads to fusion, per se, but the prolonged tonic fundamental innervation of the eye muscles that is adapted for the conditions of single vision.[16, 17] In order to emphasize this point he used the term fusion accommodation in place of fusional movements.

These studies definitely establish the fact that the tonicity induced by fusional movements does not disappear immediately after the fusional

stimuli have been removed. However, the length of time that these effects persist as well as the rate of their disappearance is not known. Since these factors are of utmost practical significance, an experimental investigation of them was undertaken.

APPARATUS

The essential components of the instrument used in this investigation are shown in Figure 3. They consist of: two front surface mirrors,

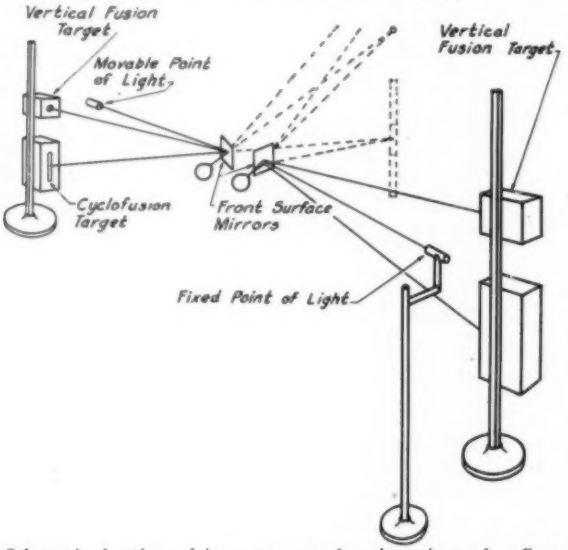

Fig. 3. Schematic drawing of instrument used to investigate the effect of different characteristics of the fusional stimuli on the inducement of positive and negative vertical divergence.

two (point of light) sources, and suitable housings for the presentation of fusion targets to the eyes.

The target housings were mounted so that they could be moved vertically to any desired setting. The positions of the housings were determined by scales graduated in millimeters. The precision of a setting was $\pm$ 1 millimeter. The point of light source visible to the right eye was kept at a fixed position. The point for the left eye was adjustable vertically; this was accomplished by mounting the point of light source on a trolley which was movable on an optical bench. A scale affixed to one rod of the optical bench and a pointer for the scale mounted to the trolley permitted the position of the point of light

source to be read with an accuracy of ± 1 millimeter. Provisions were made so that the subject could accurately adjust the position of this source.

The vertical planes which contained the targets and points of light sources were 3 meters from the eyes. Although the vertical fusion targets were aligned on the same horizontal axes at their zero positions, the angles of the mirrors necessitated a convergence of the eyes at 3 meters. The background for the targets for both eyes consisted of large flat black surfaces on which no details were visible.

The brightnesses of the vertical fusion and cyclofusion targets were 600 and 1800 c/m^2 respectively. Although only one set of cyclofusion targets is shown in Figure 3, a second set located above the vertical fusion target housings was used in all of the experiments in this investigation.

EXPERIMENTAL PROCEDURE

The same techniques which were used previously in other investigations with the above mentioned apparatus, were also employed in this study.[18] With the instrument each eye fixated identical luminous circular discs as illustrated in Figure 4. These discs were at a distance of 3 meters from the eyes and subtended an angle of 0.50° at the entrance pupils. In this investigation the discs were always fixated by the subjects and consequently their images fell on the foveas.

For the inducement of a vertical divergence the procedure was followed of increasing the separation of the discs in successive steps of 0.25°. However, the length of time that any given separation was presented and thus fixated varied in the different experiments.

The method which was used for measuring the vertical divergence of the eyes employed two laterally disparate point of light sources (measuring points), one of which was fixed in the primary position of the plane of fixation, and the other which was vertically adjustable. The vertical divergence of the eyes was measured by the horizontal alignment of the adjustable measuring point with the one which was fixed in position.

Since lateral measuring points were used, it was necessary to control the torsional position of the eyes. This was done with the cyclofusion targets which consisted of luminous streaks of equal width but of dissimilar length. These targets also controlled the position of the eyes in the horizontal direction. Since the cyclofusion targets did not induce vertical fusional movements, this arrangement permits the circular targets to be the sole determinants of the vertical position of the eyes.

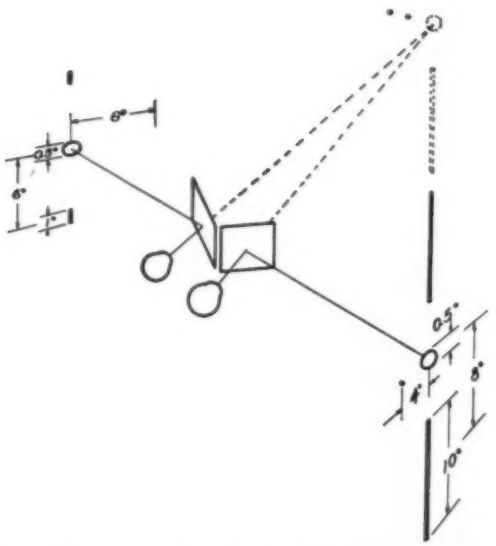

Fig. 4. Illustrative sketch of typical targets employed in the study of vertical divergence. The distance of the targets from the eyes is 3 meters. The dimensions are angular measurements from the center of the entrance pupil. Similar targets inducing vertical fusional movements (in this case the circular targets) are called vertical fusional targets; the retinal images of these targets are referred to as the vertical fusional stimuli. The long and short narrow targets seen by the left and right eyes respectively are the cyclofusional targets used to control the torsional position of the eyes. The small, point of light sources are called the measuring points.

For the measurement of a phoria following the inducement of the eyes into vertical divergence, the circular disc for the right eye was extinguished. The subject would then continue fixation on the disc seen by the left eye. Since the cyclofusional targets maintained a constant lateral as well as torsional positions of the eyes, this method permitted an accurate measure of the fusion-free position of the eyes in the vertical meridian.

RESULTS

In a previous paper, the influence of various characteristics of the fusional stimuli on the inducement of fusional movements has been considered.[19] In this study, attention is directed only to relative fusion-free positions of the eyes after they have been induced into vertical divergence.

It has been shown that the amplitude of vertical divergence varies with the rate of separation of the fusion targets. Consequently, one

approach to this problem would be the use of varying rates in order to induce the eyes into different positions of vertical divergence. The fusion-free position of the eyes could then be determined after dissociation occurred. Another possibility would be the use of a constant rate and to vary the time at which dissociation would commence. Actually, both methods were used in this investigation.

Figure 5 illustrates the fusion-free positions of the eyes after the

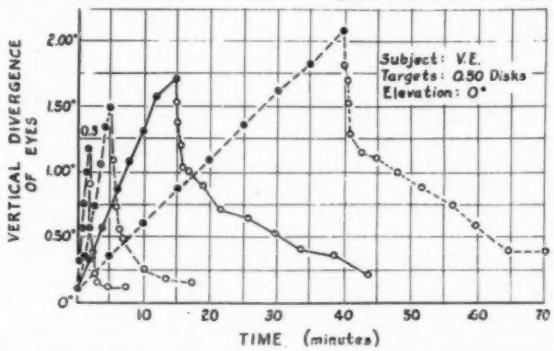

Fig. 5. Fusion-free positions of the eyes following movements of positive vertical divergence. The rate at which the movements were induced are given by the numbers on the curves. Thus, for the curve marked 5 min., the rate of introducing the disparity of the fusional targets was 0.25°/5 min. The curves given by the solid points represent the extent of vertical divergence of the eyes at any given time. The curves formed by the hollow circles stand for the fusion-free positions of the eyes.

maximal positive vertical divergence had been attained using varying rates of increasing the vertical separations of the targets. The fusion targets were single discs of 0.50°. The disc which was visible to the left eye and whose position was fixed during the experiments was located at 0° elevation.* The results which are illustrated by the different curves indicate that the residual tonicity varies with the rate at which fusional movements are induced and possibly, the extent of the vertical divergence.

In order to prove that the extent of the vertical divergence influences the residual tonicity, experiments were performed using a constant rate of separation of the vertical fusion targets and varying the time at which dissociation commenced. The results given in Figure 6 were secured with this method. The same type and location of targets was used for these experiments as for the previous experiments.

It appeared possible that the residual tonicity of fusional move-

*Zero degrees of elevation would correspond to the straight forward position of the lines of sight with the head in an erect position and the face plane vertical.

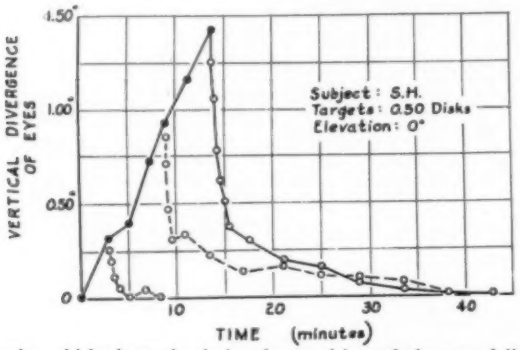

Fig. 6. Results which show the fusion-free position of the eyes following movements to various degrees of positive vertical divergence. The rate of inducing the movements was 0.25°/2 min.

ments would gradually increase if the length of time that the eyes were held in a given position of vertical divergence were to be increased.

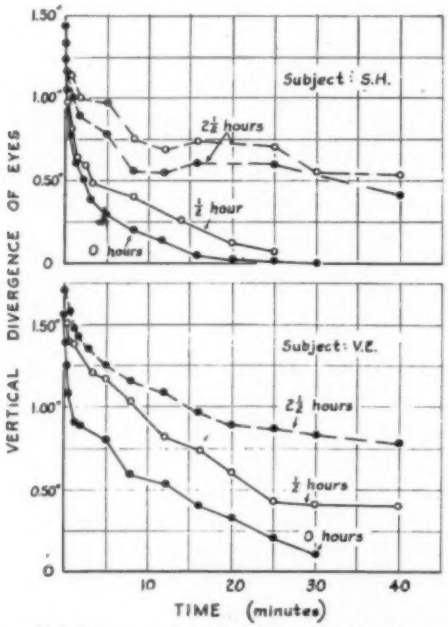

Fig. 7. Results which illustrate the vertical phorias after the eyes had been maintained in the position of maximum vertical divergence for varying lengths of time. The numbers adjacent to the curves are the lengths of time that the eyes were diverged.

For example, the eyes could be induced into the position of maximum positive vertical divergence at a given rate of introducing the disparity and then the divergence maintained by continuously observing vertically separated targets. Another possibility would be the wearing of prisms to maintain the eyes in the position of maximum vertical divergence.

The data in Figure 7 are the results for two subjects showing the increase in residual tonicity after the eyes were maintained in a position of maximum positive vertical divergence. For these data, the fusional movements were induced by targets, which were 0.50° in size, and the separation of which was increased at the rate of 0.25°/two minutes. A 2.5Δ base-down prism for the right eye was used by subject S. H., and one having a power of 3.0Δ by subject V. E. The lengths of time that the prisms were employed for the data of the different curves are indicated on the graphs. That the residual tonicity gradually increased with the length of time (to 2½ hours) that the eyes were held in a position of divergence suggested that if the length of time were to be made longer, a further increase of the residual tonicity might be secured. The data given in Figure 8 show that the tonicity actually decreases rather than increases for lengths of time greater than 2½ hours. For these experiments, the subject continuously wore a 3.0Δ base-down prism before the right eye during all of his waking hours. At

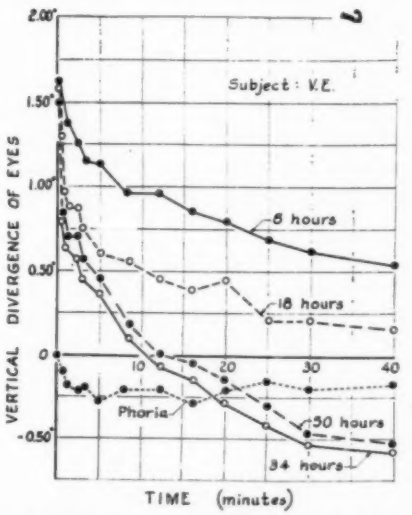

Fig. 8. The vertical fusion-free positions after the eyes had been maintained in the position of maximal vertical divergence for prolonged periods of time.

no time during the course of any one experiment were the eyes induced into any other position than the maximum positive vertical divergence. The number on the curves in Figure 8 are the number of waking hours that the prism was worn for each experiment.

Although the method which has been used in the above experiment gives a measure of the residual tonicity, it does not provide any indication of the length of time that the tonicity would persist if fusional movements in an opposite direction were to be induced. In order to investigate this possibility, a subject wore and obtained single binocular vision with a 3.0Δ base-down prism before the right eye. At the end of a 2½ hour period, the prism was removed and the subject immediately fixated paired 0.50° targets which were both located at 0° elevation. This fixation was continued for a period of time and then the relative fusion-free positions of the eyes were determined. Figure 9 is a plot of typical results. The cross-hatched area indicates the length of time that the subject fixated the 0.50° targets. These

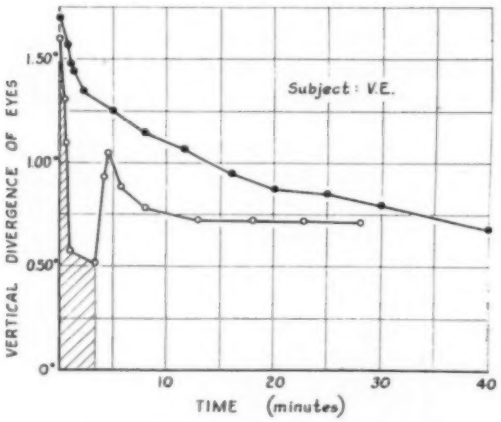

Fig. 9. The effect of inducing a fusional movement in the opposite direction to the residual tonicity of the eyes is illustrated. For comparison, a plot of the fusion-free positions of the eyes without the interference of the tonicity induced by a movement of negative vertical divergence has been included. For the data in both of the curves, the subject had worn a 3.0Δ prism base-down before the right eye for 2½ hours prior to the measurements. The cross hatched area indicates the time during which the subject fixated 0.50° targets located at 0° elevation.

results show that a considerable portion of the tonicity induced by a fusional movement in one direction persists after a fusional movement in the opposite direction has been produced.

DISCUSSION

There are two findings in the results presented above which deserve to be particularly noted. The first is that the extent of vertical divergence of the eyes depends upon the rate of introduction of the vertical disparity. If the rate is high, the limit of vertical divergence of the eyes will be relatively low and vice versa. In comparison, this finding is in accord with other reflex muscular actions in the body. In fact, many reflexes gradually increase to a maximum when a stimulus of unaltered intensity is merely prolonged. This is due to the activation of a progressively greater number of motorneurons. The phenomena is called *recruitment* and is figuratively spoken of as "inertia." The clinical implications of this finding especially with regard to the measurement of ductions are unquestionably important.

The second finding to be emphasized, is that the rate of disappearance of the tonicity which produces a divergent position of the eyes is not constant. The rate decreases with an increase in the length of time that a divergent position was maintained to a limit of several hours. Beyond this limit, the rate at first remains relatively constant and then gradually increases. The prolongation of a reflex response after the stimulation of the afferent nerve or receptor has ceased is called *after discharge* in physiology, and is referred to as reflex "momentum." In general, the higher the reflex center and the more interrelated the reflex arc, the longer will be the after discharge. For many reflex muscular actions in the body, an increase in the strength or duration of the stimulus lengthens the after discharge. Also, increasing the intensity of a stimulus has a relatively greater effect upon the duration of after discharge than upon the amplitude of the contraction; after the latter has been increased to a maximum further strengthening of the stimulus lengthens the after discharge. Comparing these results with those found for vertical divergence of the eyes a close similarity is apparent.

The fact that the residual tonicity followed a vertical divergence of the eyes disappears at varying rates has important implications in the measurement of vertical phorias. For example, consider a patient who has a vertical phoria following occlusion of an eye for one hour but nevertheless ordinarily maintains single vision by the use of fusional movements. Further, assume that a refractive examination of this patient is made and that the vertical phoria is measured as one test in a battery of tests. If vertical fusion is broken only momentarily or for several minutes at most, during a phoria measurement the results presented above indicate that only a fraction of the anomaly will be

measured. Since the object of a phoria measurement is the determination of the relative positions of rest of the eyes in the absence of fusion and the residual effects of fusional movements, this end cannot be attained unless fusion is prevented for longer periods of time than that usually allocated during a routine examination.

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ABSTRACTS

THE INVERSE SQUARE LAW OF ILLUMINATION. J. I. Pascal. Optometric World 37: p. 21. March, 1949.

The fundamental law that the intensity of illumination varies inversely as the square of the distance must be used with a certain degree of caution. The law holds good for a point source or when the source is very small relative to the distance. When the source is exceedingly large, it does not hold true at all. Thus, for a given size source, the illumination on a surface decreases slowly as the surface is moved away; then decreases more rapidly until at a distance about 10 times, or at least five times, the size of the source, the inverse square law begins to operate. In addition, the inclination of the light source to the screen must be considered, as the intensity follows the "cosine law of radiation," and the illumination diminishes proportionately to the cosine of the angle of inclination.

AUTHOR'S ABSTRACT

NOTES ON FUNCTIONAL DISTURBANCES OF VISION*

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Functional involvements of vision are not uncommon and in many instances the optometrist is consulted by a patient whose complaints, while ocular, are the manifestations of psychic disturbances. It is necessary, then, that the practitioner possess a knowledge of the manifestations of these psychic conditions so that proper treatment may be instituted without delay. It is more vital now than ever before that these conditions be recognized, for with the number of optometrists engaged in visual training increasing every day, it is not inconceivable that an hysterical amblyope be given visual training when he is actually in need of psychiatric treatment. While visual training might conceivably eliminate the amblyopia for a short time, it may also delay the recognition of the psychosis or neurosis and cause it to become more firmly entrenched within the patient until it manifests itself through different and more serious symptoms.

The manifestations of functional ocular disturbances vary greatly both as to type and degree of severity, ranging from asthenopia to what the patient interprets as complete amaurosis. Such individuals should be considered as suffering from a psychoneurosis and should be treated accordingly. Functional amblyopia and amaurosis has its greatest incidence among young women, but it may develop at any age in either sex. The exciting cause is often fear, accident or apprehension and either or both eyes may be affected. Functional amblyopia has often been found in boys and girls from 10 to 14 years of age and at this age a cure may readily be effected by suggestion therapy. In older patients the symptoms are much more difficult to correct by suggestion.

Functional visual disorders are also manifested by clonic blepharospasm, characteristic ptosis and polyopia, with alterations in the color of the printed page, provided the pupillary reflexes are normal and the eye is free from pathology. Hysterical ptosis has the same appearance as the common paralytic type. It is most frequently bilateral and may be either acute or chronic. It may or may not be associated with hysterical amaurosis, amblyopia, constricted fields or other signs of a functional disturbance of vision. It can usually be relieved by pressure on the supra-orbital nerve on the same side. In hysterical ptosis the

*Submitted on November 5, 1949, for publication in the January, 1950, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.
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patient does not make an effort to raise the eyelid by contraction of the frontalis as is the case in paralytic ptosis.

The onset of hysterical disorders of vision is most often abrupt, and in functional blindness the individual usually is peculiarly lacking in the depression which would be expected to result from a loss of visual function. In amblyopia the symptoms may be intermittent with first one eye and then the other exhibiting the symptoms for several days at a time. Some cases of functional amblyopia and amaurosis have been known to persist for years when complete and spontaneous recovery has occurred. Ordinarily recovery is expected in from a few days to a few weeks.

The greatest difficulty in the diagnosis of functional blindness lies in differentiating the hysterical from the malingerer, and the standard malingering tests should be administered with care. Establishing the diagnosis is the first part of the treatment. When the examiner suspects that the defective vision is functional his suspicion can be confirmed only when the patient responds with a visual acuity heretofore impossible to obtain. This first admission of improvement is most difficult to secure. The diagnosis is accomplished by the recognition of inconsistencies in the defects themselves and between other features of the case as revealed by the history, mode of onset, and course of the defects. One of the most significant points in the diagnosis of functional amaurosis is that the patient, while professing total blindness, is able to move about a room without colliding with objects.

Probably the most valuable instrument in the diagnosis of functional visual disturbances is the perimeter or tangent screen. In many instances fixed field changes characteristic of hysteria are found in hysterical individuals who have not yet complained of any visual defect. Concentric contraction is the primary field change evidenced in hysteria. This contraction remains more or less unaltered in extent when examined at different distances or with objects of different size. The field is a tubular one which is necessarily of subjective origin. The field is usually constant while the test is being made, but varies considerably on different occasions. The blind spot is often enlarged. The field defects are usually symmetrical when there is a binocular involvement. It is usually immediately apparent that the field defect is much greater than the ophthalmoscopic picture would indicate. The fields are generally reduced between 20 to 30 degrees and are often reduced to 5 or 10 degree circles. Functional field changes are caused by the disordered action of parts of the brain rather than the oculo-calcarine visual path, where lesions cause changes of an organic type. The interference with the visual function is at the will of the patient, and it is the patient

who is at fault, not his visual mechanism. The visual symptoms, while producing distinctive features, exhibit peculiarities and inconsistencies of a similar kind. Functional field changes depend upon suggestion which may be the result of injury, illness or some other mental impression. The most common functional field defects are concentric contraction, reversing or interlacing of the color fields, and some sort of ring scotoma. Often during the color test the patient may name a color by its complementary when it is dimly or doubtfully seen. This condition may also exist, however, when an organic lesion is present. Central scotoma is never present in functional amblyopia. One of the most important factors in diagnosing the field defects of hysteria is the inconsistencies of the defects. The patient's history, the onset of the visual disturbance and the course it runs is often an aid in the diagnosis. When the patient complains of almost complete blindness the remaining vision is always central and the condition resembles quinine poisoning. The patient's history and the other signs of quinine poisoning obviate differentiation. The perimetrist must be careful to avoid involuntary suggestion while charting the fields, but the subtle use of suggestion to alter the field knowingly is often of value in the diagnosis. Misdiagnosis is most likely to occur when an actual organic lesion is associated with the functional element, but careful examination will avoid this.

The most effective method of diagnosing functional malfunctions of vision is through the use of quantitative perimetry. By using the same visual angle at different distances or different visual angles at the same distance, gross inconsistencies can be easily uncovered.

To summarize, functional disturbances of vision are quite common and have their greatest incidence among young women. It is essential that the optometrist screen out these patients and refer them for proper treatment. Great care should be taken in differentiating the hysterical from the malingerer. Hysterical involvements of vision assume a characteristic visual field and the use of quantitative perimetry has been proven to be the most efficient means of diagnosing this form of visual disfunction.

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CARRYING OPTOMETRICAL SERVICE TO THE ESKIMOS OF THE EASTERN ARCTIC*

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The Canadian government, as part of its responsibility to its wards, the Eskimos, who inhabit the Canadian arctic, some few years ago initiated an annual health service, sending physicians, dentists, scientists, nurses and supplies to the eastern arctic where approximately 6,000 Eskimos are located.

This work was conducted by the Department of National Health and Welfare, who utilized the existing facilities of the Eastern Arctic Patrol vessel R. M. S. *Nascopie* owned by the Hudson Bay Company, which was this year, 1947, embarking on its 34th annual voyage of Hudson Strait and Hudson Bay and Arctic Archipelago. The voyage usually extending over a period of from fourteen to sixteen weeks during which twenty-five to thirty calls were made. The wartime invasion of the eastern arctic by large groups of white men had unfortunately carried with it the diseases of civilization to the far north, and the health of the natives was becoming a matter of concern to the Dominion government who, mindful of their duties to their wards, were taking whatever steps were possible to better the situation.

Ophthalmic surveys had been made during the summer of 1945 and 1946, initiated and conducted by the Canadian National Institute for the Blind under authority and instructions of the Department of National Health and Welfare. The 1945 expedition included an ophthalmologist of Hamilton, Ontario, an optometrist, Arthur Tweedle, R.O., (also at that time of Hamilton), and a nurse-secretary who completed the full round trip. Arthur Tweedle, an exceptionally good amateur photographer, also acted as official photographer. On the 1946 expedition J. F. A. Johnson, M.D., was the ophthalmologist in charge, accompanied by Arthur Tweedle for part of the voyage and J. Fostner, Toronto, dispensing optician for the remainder. On this cruise about 1500 X-ray photographs were taken of the natives and regular clinics

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*Excerpts from the banquet address, "The Last Voyage of the R. M. S. *Nascopie*." Read at the annual meeting of the American Academy of Optometry, December 11, 1949, Cleveland, Ohio. For publication in the January, 1950, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.

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were organized at each point of call. A most interesting and instructive report by Tweedle on these two trips has been published in the optometrical press since that time.

Being cognizant of Tweedle's work in the Arctic, it was with some surprise that I received a call from Col. E. A. Baker, O.B.E., in March, 1947, asking me if I would like to take a trip to the Arctic that summer. Col. Ed Baker, a blinded war veteran of the 1914-1919 campaign, is National Director of the C. N. I. B. and an old friend of mine who has co-operated with me and used his influence on many occasions in our efforts to better the status of optometry and to bring about a better understanding between the two professions, optometry and ophthalmology. He explained to me that on previous voyages the C. N. I. B. had, at the request of the Canadian government, organized and conducted similar expeditions, the government had now decided to undertake the work themselves and had requested him to recommend an optometrist to accompany the R. M. S. *Nascopie* from Montreal to Churchill for the purpose of providing optometrical service to the natives at the several ports of call. He informed me that I would be on my own as no arrangements were being made for an ophthalmologist to form part of the group. Early in April I received an official invitation from the Department of National Health and Welfare, stating the remuneration I would receive and informing me that the *Nascopie* usually sailed about July 4th, and that if I was satisfied with the suggested arrangements, C. N. I. B. would make available previous records and advise me as to requirements in lenses, frames, etc. The concluding paragraph stated "Colonel Baker pays generous tribute to your training and experience and we would be most anxious to have your assistance this coming summer."

In the meantime I had discussed the trip with Tweedle and Fostner who had previously made the trip and from the slides which Tweedle had graciously projected for me at a special private showing I was beginning to get an idea of what I was likely to encounter. It now being definitely settled that I was to make the trip, I began preparing and investigating as to how I could improve on the previous service that had been rendered. I made a trip to Ottawa to meet officials of the department and was given a fairly free hand to make my own arrangements. I visited the C. N. I. B. and obtained from them a number of lenses remaining from the previous trip, unused frames having been returned to the supply house. The lenses were first quality, all cut and edged to fit 40 mm. gold filled frames. The lenses were in the original lens boxes with the contents, number and strength written on the box

cover, numbers crossed out and changed as lenses were used, replaced or augmented. These were all contained in a large tarpaulin covered hamper 30" long by 18" wide and 15" deep, rather difficult to handle. The stock lenses contained many which I considered would be unessential, such as planos, 0.25 spheres and cylinders, etc., etc., and other powers too close to each other to be essential. I carried with me 500 pairs of assorted lenses, plus and minus spheres, cylinders and compounds, and 200 gold filled frames of measurements to my selection. I then had a strong wooden case made to my order. It was strengthened with iron bands and corner pieces. Drawers were so constructed to size that there was just sufficient space for my lens and frame stock positioned so that the boxes fitted in snugly and could not be shaken about. There was an additional drawer with a plier rack and space for instruments. The drawers were so built that the list of contents of each box listed on the cover were visible without any difficulty.

I was not satisfied with the type of frame that had been used previously, being of the opinion that something more comfortable could have been provided. It had been explained to me that in the extremely cold weather, metal which touched the face would sear the skin and I felt that this would be obviated by using either a shell covered frame or one made of plastic. The old type Windsor frame with inset shell covered bridge and extra long shanks with its easy adjustment would be ideal for the purpose, but they were not obtainable either on this continent or in Great Britain at such short notice. It had been explained to me that in many instances the pads of the G. F. frames being used had to be so adjusted that they rested and formed a bridge across the nose instead of fitting comfortably on the sides. I also tried to obtain plastic frames with inset bridges but again there was insufficient time to obtain them. Should I be given the opportunity of another arctic trip I would certainly carry plastic frames with inner core temples in preference to the G. F. frames which I carried on my first trip. I would also give consideration to hardened or some form of non-shatterable lens. I had been informed that Ottawa would provide me with a trial case, retinoscope, ophthalmoscope, trial frame and pliers, but not knowing what might be provided I decided to take my own ophthalmoscope and retinoscope to which I was well accustomed and somewhat attached. I realized I was in for a difficult task and intended to do everything possible to make it easier. As there would probably not be electrical power I also carried a box of batteries, a lens gauge, additional trial frames including a single cell one, a Maddox Rod, a Meyrowitz comparator (—25 and +25 spheres), the regular

and illiterate test charts and cards, and a Syllabic test chart and Bible, needles and thread, and English pocket axis finder, cross cylinders, lens cleansers, and non steam pencils. Also a condensing lens for indirect ophthalmoscopy and better viewing of the media, a protractor, lens marking pencils and a couple of bead top pins, one white for rapid gauging of the fields and one specially made double top red for detecting relative control scotoma. I considered these almost essential for examining people who could not speak or understand English.

I had been given to understand that because of the lack of space and the movement of the vessel even in smooth seas, equipment had to be kept down to a minimum size. I had been given an additional responsibility inasmuch as there would be no consulting ophthalmologist available should an emergency ophthalmic operation or case needing immediate medication be met with, so I also took along that exceptionally good book *The Eye and Its Diseases* by Conrad Berens, and Tasman's splendid book on *Ocular Symptoms of Disease*, in order that the general practitioner aboard could be guided in case of such an emergency arising. I had little doubt that should such cases be met with I would have little difficulty in detecting them. For my own glaucoma I carried a couple of bottles of 1% pilocarpine and 2 tubes of eserine ointment—the loss of which in the subsequent shipwreck caused me my greatest worry.

Upon arriving on board the *Nascopie* I discovered that Alex Stevenson, assistant to the Director General of the eastern arctic understood Syllabic. I had been jotting down various remarks and questions that I generally used in my examination routine and I prevailed upon Stevenson to transcribe them into Syllabic, with their Eskimo pronunciation. I discovered later that I could almost conduct an examination with the one word "Manalooney," meaning "better this way!" and again "Manalooney?" "better this way?" I also had him tell me the pronunciation of the Syllabic test chart letters which pronunciation I placed on the chart and then later made a small facsimile of it on a small card which I kept beside be during examinations. This proved very valuable and also gave my patients additional respect for my wisdom and knowledge as they were quite mystified as to how I knew when they miscalled letters.

The Syllabic alphabet was devised by James Evans, a Methodist minister employed by the English Wesleyan Society around 1840, at which time neither the Indians or Eskimos of Canada ever had a written language and Roman letters were inadequate to transcribe the native dialects, which did not readily lend themselves to the conveying of

vague, un-English sounds. In 1878, an Anglican missionary, E. J. Peck, adapted the Syllabics to Eskimo and today it is known throughout the Northwest Territories and used by the Roman Catholics as well as the Anglicans, and New Testament, prayer and hymn books have all been rendered in Syllabics.

I was called upon to make my first examinations while we were docked at Cartwright; my patients being an Anglican missioner and two or three English speaking Hudson Bay employees. Most of the officers and passengers being ashore it was possible for me to use the *Nascopie* dining saloon with its wooden panelled walls for my charts, good lighting and lots of space for working, so that this first experience was comparatively simple and I met with no particular difficulties. It must be understood that not only was I to make my examination but I also had to make up and fit the required prescription right away. As most of my patients had not had any previous optometrical service, I was able, even with the crude methods available, to benefit them considerably and was congratulating myself on the little difficulty encountered but I was in for a rude awakening and shocks later on in the trip.

At the next stop, Lake Harbour, where we arrived on July 14th, we held our first clinic ashore using a prefabricated hut intended for a nursing station, for the purpose. It was partitioned off into separate rooms and many Eskimo patients having been notified beforehand, were gathered outside awaiting our arrival. Equipment, instruments, etc., all had to be taken ashore by boat and then carried quite a distance over the slippery rocks. Our patients were guided first to the administrative officials who registered all who came in, men, women and children, checked on their identification discs, which they wore attached to a piece of string around their necks. Each clinician was allotted an interpreter through whom all conversation was carried on. Many of the women apparently did not know who they were, having in many instances changed their Eskimo names, such as "Chookalook" to a biblical one such as "Rachel" or "Ruth." There were innumerable "Marys," and to aid identification they were listed as the daughter of, say, "Takeealoo" and given a number which was stamped on the identification disc. They were all quiet and obedient, co-operating with us wonderfully well.

After being registered they were given a medical check up by Dr. Lewis, medical superintendent of the eastern arctic, who had had a lot of experience with the Eskimos, and his assistant, Dr. Cummings, a recent graduate in medicine from Toronto University. After the medical examination they proceeded to the dentist for a dental inspection,

then on to Dr. Sinclair, Professor of Biological Chemistry, Queens University, who was travelling with us and wished to take part in the clinic. He selected a number of Eskimos in various age groups for blood and urinalysis tests and from him they came to me for visual check up. As with the other clinicians, I worked through an interpreter, who advised me of the age and symptoms, which were recorded, while others were directly referred to me from the physicians with age and symptoms already recorded. The following examination and refractive routine was followed:

(1) Field of vision with bead top pin using confrontation method. (2) P. P. convergence. (3) Pupillary reactions. (4) External eye examination with oblique illumination. (5) Ophthalmoscopy, indirect whenever possible. (6) Visual acuity — monocular and binocular using Syllabic chart hung on wall in good light. (7) Reading from Bible, noting distance at which this most easily accomplished—"manalooney," "manalooney." (8) Pupillary distance measured and convergence reaction peculiarities noted. (9) Static retinoscopy, if astigmatism indicated, I invariably took preliminary measurements with spheres in two principal meridians, fining up with cylinders. (10) Dynamic skiametry, fixation and observation at 16" measured with steel tape rule, fixation target characters on instrument. (11) Subjective test using cross cylinder for astigmatism, "manalooney, manalooney." (12) Muscular imbalance using Maddox rod. If marked imbalance, fusion test with red glass. (13) Reading test using Syllabic Bible and again, "manalooney, manalooney" for reading distance, etc. "Manalooney" was also particularly efficient using monocular comparator test, —25 and +25 sphere flip test. (14) Having arrived at my prescription, a frame was selected and pliered to fit comfortably. (15) Lenses nearest to prescription arrived at, selected and fitted into frame. (16) Final fitting of frame and checking of axes with pocket axis finder.

My patients were often quite voluble in their appreciation but one old woman whose vision was improved considerably with her new glasses went several steps further, doing a regular song and dance for me. I questioned the interpreter as to what she was saying and was informed she was "thanking the good Lord who had given her new eyes" and the grin which usually stretches from ear to ear, became even wider in response to my interpreter-put question as to "whether she meant me or my 'boss man' up above."

It was not long before I met with one strange symptom, very general among the presbyopic women, it was that the glasses fitted a year ago gave them backache, when they did their sewing, and delving

into this I arrived at the solution that their glasses had been fitted for a 13 to 16 inch distance while they generally sewed, with the hides they were working on, across the knee at an approximate distance of 20 inches.

After a full day's work at Lake Harbour we went aboard and proceeded to our next point of call, Sugluk, where we arrived on July 18th at about 5 p. m. It was very stormy, high wind and snow. Immediately upon arrival we commenced work, this time using the forehold adjoining the physicians' office for our clinic. The hatches were wide open and the noise of the winches as cargo was transferred, some being taken ashore while skins, etc., were brought aboard, added to the roar of the storm and the shouting of orders to the crew was terrific, nevertheless I had my job to do. Here my test chart was illuminated by an uncovered bulb on an extension cord slung into the best position possible. This had to suffice although it was not very satisfactory. It was very cold and my hands became almost numb, making it difficult to put together the glasses which I was prescribing. We worked steadily from 5:30 p. m. until past midnight, when with the job finished, we quit for supper. This was really optometry under difficulties.

We sailed at 4 a. m. the next morning leaving Sugluk with its population of 5 whites and 200 Eskimos for Wolstenholme, our next point of call. Wolstenholme has a population of only two whites and 140 Eskimos spread between it and the tiny settlement of Xvugivik where there is a tiny Roman Catholic mission occupied by two priests. We arrived at Wolstenholme during the early evening of July 20th. Arrangements had been made to have our clinic aboard, the patients coming on ship about 6 p. m. This time I had my trial case, lenses, etc., just inside the physicians' cabin with the patients sitting on a chair just outside the doorway. While my test chart was strung up behind a light 20 feet away. The quarters were very cramped, Eskimos and others constantly pushing past while I was endeavoring to make my examinations. It was in these crowded quarters that I first really noticed the odor of seal oil which now pervaded the whole ship. It was here that I examined the eyes of Father Steinman, a Catholic priest, 34 years of age. He was quite an arctic character and had a flowing fiery red beard which spread halfway over his chest.

We sailed from Wolstenholme in the early hours of July 20th for Cape Dorset, 120 miles away, but the *Nascopie* was destined never to reach there, striking a hidden reef and sinking when we were about 16 miles from our destination.

Now a few figures and comments regarding my patients and their

ocular condition. On the whole I found the Eskimos' refractive condition particularly good with very few of the younger ones actually needing lens corrections. The older women needed presbyopic corrections for sewing and Bible reading, although Eskimo women of 50 looked fully 70 with their lined and wrinkled faces, their ocular functions, accommodation, etc., were practically the same as found in white patients of similar age. I had one or two men with no distance error worthy of correction requesting glasses possibly for the distinctive appearance which they thought the glasses would give them; one man claimed he could shoot better with the glasses of a friend of his, but I proved to my own satisfaction that none were required and so none were prescribed. They are very much like children in some respects. Out of a total of over 250 Eskimos whom I checked, I fitted 31 with corrections. I made a particular point of checking the visual acuity of 65 boys and girls between the ages of 10 to 15, but did not uncover one single case of myopia.

The cases for which I prescribed were as follows: Presbyopia, 17; hyperopic astigmatism, 8; hypermetropia, 6.

In the records of 107 previous corrections I found myopia, 1 only, (—15.00 O. U.); simple myopic astigmatism, 2; compound myopic astigmatism, 2; esotropia, 5; *pathology*, corneal nebulae and scars, 17; blepharitis and conjunctivitis, 10; pterygia, 4; iritis, 5; cataract, 5; (three of these being traumatic); leukoma, 2; nystagmus, 2; optic atrophy, 2; (one blind in both eyes); sclerosis, 1; one mother and infant daughter 7 months old had interstitial keratitis and adherent leukoma. All of the above cases had been diagnosed by the ophthalmologists on previous trips and given medical treatment, in some cases continued by the Post managers under instruction from the ophthalmologist. I found many Eskimos with light colored irises and there was a fair number with aquiline features in contrast to the majority of Mongolian cast. There was even one Eskimo girl with red hair, while an Eskimo boy, who was decorated for bravery, had a definite Irish look about him. Of course, these contrasts were due to inbreeding. I found the P. D. measurements in the men varying from 62mm. (only one so low) up to 72mm., with an average of 67mm., while in the women they ranged from 60mm. to 63mm. My instruments, stock of lenses and frames, and personal effects all sank with the ship as did also all the medical and dental supplies.

AMERICAN JOURNAL OF OPTOMETRY
and ARCHIVES *of*
AMERICAN ACADEMY OF OPTOMETRY
Established 1924

Vol. 27 JANUARY, 1950 No. 1

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Annual Subscription, $5.00 in Advance; Canada, $5.50; Foreign, $6.00; Single Copies, 50c.

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Published Monthly by the
AMERICAN JOURNAL OF OPTOMETRY PUBLISHING ASSOCIATION

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CONVENTION FINANCING NEEDS STUDY

With the 53rd Congress of the American Optometry Association at Minneapolis for June of this year, and with the traditional A. O. A. policy of financing a large part of its annual Congress costs unchanged, it is well to consider this matter and examine just what the future holds in this respect.

For many years the A. O. A. has relied upon (1) the sale of display space for commercial exhibits at its annual Congress, and (2) outright contributions from manufacturers and others, to defray from one-half to two-thirds of the expenses of the meeting. Many State optometric associations follow similar plans.

This practice of soliciting aid to finance optometric conventions is probably in for some rough sledding. Members of both associations

of optical wholesalers and more recently the Optical Manufacturers Association are showing greater reluctance to further finance in whole or in part the many optometric conventions held throughout the country. The financial drain upon these groups for this cause since the end of World War II has been increasing, and common sense dictates that some restrictions be placed upon their generosity.

Manufacturers of ophthalmic materials and instruments have proved their interest in the welfare of optometry; so have the men who administer the affairs of the laboratories serving optometry. But this interest must square with the practical accounting of modern business. Contributions must bear some relation to possible profits, and at present they rarely do. For instance, recently an optometric meeting was held. According to reliable reports the number of optometrists registered was near the 500 mark. To display their services, equipment and materials to this group of optometrists, the manufacturers and laboratories spent more than $25,000. This sum included space rental, entertainment expense, cost of exhibits including freight and transportation, hotel accommodations and transportation costs for those who manned the exhibits. And this was a "big" optometric convention.

Each month these same men are called upon to repeat this performance on a smaller scale at optometric meetings where the attendance seldom exceeds 150 optometrists, yet where the costs are even higher when examined on an optometric participant basis. This sort of thing cannot be properly charged to advertising as no budget for this purpose would permit such spending. It can only be charged to "donations" and the good will engendered by this "giving" is of doubtful value. One is seldom thanked for picking up the tabs after a cocktail hour and dinner, yet when six or seven laboratory representatives and a manufacturer or two are forced to do this at the close of a convention, they frequently find themselves dividing a check which runs well into the high three figures, on top of renting display space and providing some additional entertainment.

From an advertising standpoint, it is doubtful if an optical commercial display can be made to pay its way if less than a thousand prospective optometrists visit the exhibit. If this is true, perhaps the time has come for optometrists to make new plans so that they may finance their conventions themselves.

To be sure, it is now too late for the A. O. A. to effect the necessary changes for its 1950 Congress in Minneapolis. Manufacturers and laboratories, we hope, will fulfill their customary role for another sea-

son at least and we believe the support will be forthcoming in the usual cheerful manner.

However, while at Minneapolis the A. O. A. might well consider the putting of its future conventions on a self supporting basis starting with 1951. Positive constructive action of this kind would have a marked effect upon future demands of State associations, as well as solving a critical problem before the A. O. A.

Conventions are held by organizations of optometrists. These organizations collect dues. Let some modest part of these dues be set apart for use at the convention. Then let those who attend pay a registration fee sufficient to finance the official business of the meeting, and pay for their own entertainment and personal expenses. This plan will force those who arrange these meetings to make them so worthwhile that the attending optometrist will feel he has had more than his money's worth. In addition, the convention group will be spared much of the distraction now supplied by those who are there only to run exhibits.

Should exhibits be desired, they should be limited to those of scientific or educational character and should be welcomed only on the basis that they contribute something to the educational program of the meeting. The space for them should not be sold.

Manufacturers and laboratory executives are willing to do their full share to contribute to the welfare of optometry, but many now seem convinced that the sums they are spending are excessive and productive of little of real value. Why not arrange for a committee composed of both groups—manufacturing and laboratory officials—to jointly explore methods of profitably using available funds. Perhaps greater contributions to the Better Vision Institute would be the answer, or perhaps the annual financing of several optometric research studies would appeal. Optometry now has the manpower and facilities but at present, lacks sufficient research grants-in-aid to carry on these studies.

These and other ideas could be explored cooperatively by optometrists, manufacturers and laboratory officials, and in the end, a real contribution to optometric well being would be made.

CAREL C. KOCH.

PUBLIC CONFUSION ON COSTS OF VISUAL CARE

Widespread public confusion regarding the cost of complete visual service is one of the current worries of optometry. Fortunately, the

Better Vision Institute is doing a masterful job of attacking this question and is reorienting public thinking on this problem. The work of this agency is of importance to optometry and should be given the fullest support by every optometrist.

Just what happened to bring about this confusion? A review of the impact on optometry of several practices among eye men which are now clashing, one with the other, in violent opposition, will partially supply the answer. These forces which first ran parallel for a long period have been converging for the past decade, and have now met, thus bringing into critical focus the public confusion on visual fees and costs of ophthalmic materials.

These forces are first, the still present though waning commercial characteristics of certain optometric establishments. These are still in evidence in the urban centers, but have been to a great degree eliminated in the smaller rural centers. While considerably modified from the utterly impossible blatant practices of the past, these commercial tendencies are today enough in evidence to confuse the public as to the proper overall cost for visual care. These commercial aspects of optometric practice must be eliminated to entirely rectify the situation.

The agency dispensing system with the so-called "rebate" was the second force, which in being suppressed, has added to the confusion in the public mind on the question of costs of visual care. The publicity this question received as the result of government suits plus the resultant readjustment of fee schedules on services and materials has muddled both the thinking and attitude of the public toward all eye men.

Next, the growing practice of dispensing industrial glasses to workers and all sorts of ophthalmic materials to indigent persons at the laboratory cost, has added to the confusion in the public mind as to the reasonableness of proper fees for visual care.

Also, the current discussion of compulsory health insurance with its obvious implications of socialized medicine has further confounded the problem. Particularly with its untruthful emphasis on "something for nothing."

The last major factor which followed as a result of those already mentioned was the very necessary change-over within professional optometric practice from a very inadequate professional service fee plus materials with a profit markup, to the newer and more proper system of an adequate professional fee with ophthalmic materials dispensed at laboratory cost plus a modest dispensing fee.

The impact of these factors merging as they did at the close of World War II has caused much confusion on the question of costs of

visual care. The Better Vision Institute seemed the proper group to lead the fight to overcome this confusion in the public mind, and in 1949 B. V. I. started a campaign to clear the air.

Through its outstanding public relations program, it is carrying on a successful fight to crystalize thinking in favor of professional eye care programs at adequate fees. It is doing an outstanding job for optometry, ophthalmology, and opticianry. One that deserves the praise and fullest support of all three groups. Optometrists may join the Better Vision Institute for an annual fee of $5.00. A telephone call to your local laboratory is all that is required. Make that call today!

CAREL C. KOCH.

TRANSACTIONS OF THE AMERICAN ACADEMY OF OPTOMETRY

A department devoted to announcements, reports, appointments, organization data, news, professional problems and ideals, as these relate to the Academy.

CLEVELAND MEETING OF ACADEMY*

DR. JULIUS NEUMUELLER AWARDED HONORARY LIFE FELLOWSHIP

The Academy's fourth honorary life fellowship was awarded Dr. Julius Neumueller of Haddonfield, New Jersey, at the annual meeting in Cleveland in December, in recognition of his outstanding contributions to the field of visual science. The Life Certificate was presented at the annual roundtable dinner by Dr. Harold Simmerman of Woodbury, New Jersey.

In presenting the award, Dr. Simmerman pointed out that Dr. Neumueller's career defied presentation in a straight line, for it has been unusually varied and colorful. After a childhood in Bavaria, education in engineering in Munich, Germany, and a brief career on the stage abroad, Dr. Neumueller joined the firm of Hauseman and Company, optometrists and opticians, in the United States. While associated with Dr. Otto Hauseman at Philadelphia, his interest in optics influenced him to attend and teach in the Pennsylvania State College of Optometry, and he received his O. D. degree in 1924. Since that time, Dr. Simmerman told the audience, Dr. Neumueller's contributions to optometry and the field of visual science have been outstanding. In 1925, he worked in the Instrument Division of the American Optical Company. Later he lectured on procedures and techniques, and then went to the Dart-

*By Virginia Huck, Staff Writer and Editorial Assistant, American Journal of Optometry & Archives of American Academy of Optometry.

mouth Eye Institute in Hanover, New Hampshire to assist in aniseikonic research.

In 1934, he organized the Bureau of Visual Science as a research department in the American Optical Company, and is still consultant of this department, as well as chief of the clinics of the Pennsylvania State College of Optometry, and a private practitioner in Haddonfield.

Dr. Simmerman concluded his presentation speech with a review of Dr. Neumueller's major writings: *Ophthalmometry, Aniseikonia, Binocular Vision, External Ophthalmic Examination, Interpretation of Binocular Findings,* and *The Correction Lens.*

In accepting the award, Dr. Neumueller told Academy Fellows, "It is with deep appreciation and great joy that I accept the honor bestowed upon me. I accept this honor not so much as recognition of my contributions to the art and science of optometry, but rather as your official recognition of my loyalty to our common cause."

Dr. Neumueller credited Dr. Otto G. Hauseman of Philadelphia, and Dr. Albert Fitch, founder of the Pennsylvania State College of Optometry, with instilling in him enthusiasm for optometry, and shaping his optometric career. He also paid tribute to his wife for her help and inspiration in his work.

Hope was expressed by Dr. Neumueller that professions which have a secondary interest in vision will not impede the progress of professional optometry. He pointed out that only by uniting all forces can optometry remain what its founders wanted it to be—a free and independent profession.

Dr. Neumueller* has been an Academy member since 1933. His Honorary Life Fellowship, as mentioned earlier, is the fourth awarded by the Academy in its 27-year history. In 1945, tribute was paid Dr. A. W. Smith, Dean of the Graduate School, The Ohio State University, in 1946 to Dr. James P. C. Southall of Charlottesville, Virginia, and in 1947 to Dr. Frederic A. Woll of New York, for outstanding contributions to visual science.

DR. DANIEL G. HUMMEL RE-ELECTED PRESIDENT

Dr. Daniel G. Hummel, Cleveland, Ohio, was re-elected to the office of president at the Academy's annual election in Cleveland, December 11. Dr. Hummel took over the presidency in 1948, after many years of service to the Academy as chairman of the Program and Papers Committee and as a member of the Executive Council.

Also re-elected were Dr. Harold Simmerman, Woodbury, New Jersey, vice president; Dr. Carel C. Koch, Minneapolis, Minnesota, secretary-treasurer, the senior members of the Executive Council. The fol-

*See Frontispiece.

lowing Fellows were re-elected to the Executive Council: Dr. Harold Fisher (immediate past president), New York City; Dr. Lawrence Fitch, Philadelphia, Pennsylvania; Dr. Meredith W. Morgan, Jr., Berkeley, California; Dr. John Perry, Jr., Winston-Salem, North Carolina and Dr. R. W. Tubesing, Richmond, Indiana.

CHICAGO NEXT CONVENTION CITY

Chicago, Illinois was chosen the next meeting place for the Academy annual convention. The four-day session will be held in the Drake Hotel, December 15-18, 1950.

In addition to choosing Chicago for 1950, New York was unanimously voted the 1951 convention city, with the New Yorker Hotel a possible meeting place.

Academy members also discussed convention cities for 1952, 1953, and 1954, inasmuch as several invitations were received for those years. Since its affiliation with the American Association for the Advancement of Science, the Academy has been invited to meet with that group in 1952 in St. Louis, Missouri; Fellows from Denver invited the Academy to their city in 1953, and Dr. Ernest Hutchinson requested that the Academy join in the celebration of the 50th anniversary of the Los Angeles College of Optometry in 1954. All of these invitations were given to the Time and Place Committee for study.

REGISTRATION A RECORD BREAKER

A "bigger and better-than-ever" convention was promised Academy Fellows, and that's just what it was. Registration was the largest in history, the program of technical papers was, as always, excellent, and the *esprit de corps* unequalled in any convention. A total of 174 optometrists and professional guests were present.

EXECUTIVE COUNCIL ACTION

During its convention sessions, the Executive Council of the Academy passed the following resolution which was submitted to the American Optometric Association: Resolved that the Executive Council of the American Academy of Optometry endorse and urge adoption of the Code of Practice as proposed in the resolution dealing with this subject adopted by the House of Delegates of the American Optometric Association at Boston, Massachusetts, June, 1949.

The resolution of the A. O. A. referred to is one adopted in Boston requesting the Board of Trustees "to consider the formation of a Code of Practice similar to that adopted by the New Jersey Optometry Association which prohibits non-professional optometrists from membership in organized optometry."

REPORTS

The convention opened officially with a business meeting on Saturday, December 10. At this opening session, annual reports were given by President Hummel, Secretary Koch, and Dr. Meredith W. Morgan, Jr., chairman of the research projects committee. These reports appear in full in this issue.

SECTION MEETINGS

More popular than ever were the section meetings on aniseikonia, contact lenses, orthoptics and pathology. These practical clinical meetings now hold a major spot on the annual program and were held from 9 A. M. to 11 A. M. each morning of the convention instead of in the evenings as in other years. These morning meetings were well attended, the members having informal discussion periods with the leading practitioners in each specialty. Material presented in the section meetings will be published in this Journal in future issues.

DR. EDWARD BIND BANQUET SPEAKER

One of Canada's leading optometrists was the speaker at the annual roundtable banquet in Cleveland. English-born Dr. Edward Bind of

EDWARD BIND

Toronto entertained Academy Fellows with the story of his trip to the Arctic two years ago in the capacity of government optometrist. Dr. Bind was a member of a party of professional men and government

employees, sent to take care of the needs of the Eskimos. He was the only refractionist aboard the Canadian boat, *Nascopie.** Dr. Bind described his trip on the *Nascopie*, which sank when it struck an uncharted reef off Beacon Island, and his subsequent stay in an isolated Eskimo settlement, until rescued by a government plane. His excellent talk was accompanied by colored slides.

During the convention, Academy Fellows found soft-spoken Dr. Bind a man who with equal ease speaks with authority on Canadian optometric affairs, describes refracting an Eskimo in the hold of a ship, or joins enthusiastically in an after-lecture rendition of *Alouette*. Officially, he serves as Secretary to the Canadian Association of Optometrists, is Editor of the *Canadian Journal of Optometry*, a member of the American Academy of Optometry, and carries on a private practice in Toronto, to mention only a few of his activities.

The 1949 banquet was preceded by a special reception hour for Academy members, their wives and guests.

A DAY AT GENERAL ELECTRIC COMPANY—NELA PARK

A special feature of the 1949 annual meeting was the day at General Electric Company's Nela Park. At 1:00 P. M., Monday, December 12, Academy Fellows took buses from the Hotel Hollenden for Nela Park, where there were demonstrations on lighting effects and lectures on illuminating values by General Electric Company engineers and scientists. In the evening, Academy Fellows were guests of the company at a banquet, at which Dr. Matthew Luckiesh, Academy Fellow and director of the Lighting Research Laboratory, was the speaker. Additional lectures followed the banquet. Other speakers are listed under "Papers." This trip was one of the truly unusual events of the meeting and greatly enjoyed by the optometrists who were present.

SPEAKERS

In an even more than usually well-filled lecture program arranged by Dr. Robert E. Bannon and the Program and Papers Committee, the following invited speakers presented papers:

Dr. Ralph E. Wick, Rapid City, South Dakota; Dr. W. O. Vivian, Media, Pennsylvania; Dr. Henry W. Hofstetter, Los Angeles, California; Dr. Paul Boeder, Southbridge, Massachusetts; Dr. Rudolph Ehrenberg, Granite Falls, Minnesota; Dr. Kenneth N. Ogle, Rochester, Minnesota; Dr. Charles Sheard, Rochester, Minnesota; Dr. Glenn A. Fry, Columbus, Ohio; Dr. E. J. Gording, Media, Pennsylvania; Dr. Isadore Kaplan, New York, New York; Dr. Roy Marks, New York, New York; Dr. Vincent J. Ellerbrock, Columbus, Ohio; Dr. Alfred

*See page 24.

Lit, New York, New York; Dr. S. Howard Bartley, East Lansing, Michigan; Dr. Aaron Hyman, New York, New York; Dr. William G. Walton, Jr., Philadelphia, Pennsylvania; Dr. Irving I. Vics, Albany, New York; Dr. Roscoe J. Kennedy, Cleveland, Ohio; Dr. Meredith W. Morgan, Jr., Berkeley, California; Dr. Edward Bind, Toronto, Ontario, Canada; Dr. William Smith, Boston, Massachusetts, Dr. E. Krimsky, New York City; Dr. E. Craig Wilson, Rutland, Vermont; Mr. Fred W. Jobe, Rochester, New York; Dr. E. J. B. Schoen, Chicago, Illinois; Dr. Mathew Alpern, Columbus, Ohio; Dr. Henry A. Knoll, Columbus, Ohio; Dr. George W. Knox, Columbus, Ohio.

Speakers from General Electric Company who presented papers during the sessions at Nela Park were: Dr. Matthew Luckiesh, Mr. L. C. Kent, Mr. Sylvester K. Guth, Mr. A. A. Eastman; Mr. J. M. Ketch; Mr. R. L. Oetting; Mr. C. E. Egeler; Aileen Page, and Mr. Alston Rodgers.

Academy Fellows in charge of the section meetings were: Dr. Harold Fisher, New York, aniseikonia; Dr. John C. Neill, Philadelphia, contact lenses; Dr. J. Donald Kratz, Souderton, Pennsylvania, orthoptics, and Dr. William O. Vivian, Media, Pennsylvania, pathology.

The papers presented will be published in the Journal during the coming months.

REGISTRATION AT ANNUAL MEETING OF ACADEMY

CLEVELAND, OHIO—DECEMBER 10-13, 1949

Dr. Nelson E. Abrahamsen, Cleveland, Ohio; Dr. Merrill J. Allen, Columbus, Ohio; Dr. Mathew Alpern, Columbus, Ohio; Dr. J. Fred Andreae, Baltimore, Maryland; Dr. Don B. Arden, Montevideo, Minnesota; Dr. Harry C. Armstrong, Champaign, Illinois; Mr. C. Baker, Toronto, Ontario, Canada; Dr. Irving Baker, Toronto, Ontario, Canada; Dr. R. M. Baldwin, Euclid, Ohio; Dr. Robert E. Bannon, Hanover, New Hampshire; Dr. S. Howard Bartley, Lansing, Michigan; Dr. R. C. Baxter, Warren, Ohio; Dr. Otto Joseph Bebber, Denver, Colorado; Dr. Dale E. Berkebile, Rochester, Indiana; Dr. Edward Bind, Toronto, Ontario, Canada.

Dr. Paul Boeder, Southbridge, Massachusetts; Dr. B. H. Bohall, Oswego, New York; Dr. J. J. Brady, Sheldon, Iowa; Dr. R. J. Bray, Cleveland, Ohio; Dr. W. S. Brent, Barberton, Ohio; Dr. Walter I. Brown, New Bedford, Massachusetts; Dr. J. T. Campbell, Washington, North Carolina; Dr. W. L. Cheatham, Jr., Houston, Texas; Dr. Mary Clay, Fort Wayne, Indiana; Dr. Paul Connolly, Detroit, Michigan; Dr. J. C. Copeland, Chicago, Illinois; Dr. R. A. Dister, Cleveland, Ohio; Dr. L. D. Dolbear, Lorain, Ohio; Dr. Ralph L. Dublin, Webster, New York; Mr. G. E. Egeler, General Electric Company, Cleveland, Ohio; Dr. Rudolph Ehrenberg, Granite Falls, Minnesota; Dr. V. J. Ellerbrock, Columbus, Ohio; Dr. Daniel O. Elliott, Jr., South Bend, Indiana.

Dr. D. O. Emmons, Cadillac, Michigan; Dr. Otto R. Engelmann, Chicago, Illinois; Dr. William Feinbloom, New York, New York; Dr. Irving P. Filderman, Memphis, Tennessee; Dr. Isadore S. Finkelstein, New York, New York; Dr. Andrew Fischer, Trenton, New Jersey; Dr. E. J. Fisher, Toronto, Ontario, Canada; Dr. Harold M. Fisher, Mt. Kisco, New York; Dr. Lawrence Fitch, Philadelphia, Pennsylvania; Dr. J. E. Fitzgerald, Cleveland, Ohio; Dr. Laurence P. Folsom, South Royalton, Vermont; Dr. Benton Freeman, Allentown, Pennsylvania; Dr. Eugene Freeman, Chicago, Illinois.

Dr. Glenn A. Fry, Columbus, Ohio; Dr. Philip J. Galvin, Chicago, Illinois; Dr. Ernest J. Giglio, Bernardsville, New Jersey; Dr. E. J. Gording, Windber, Pennsylvania; Dr. Ralph H. Green, Boston, Massachusetts; Dr. J. Greger, Cleveland, Ohio; Dr. James H. Grout, Chicago, Illinois; Dr. Harris Gruman, Lebanon, Pennsylvania; Mr. Sylvester K. Guth, Cleveland, Ohio; Dr. Howard F. Haines, Columbus, Ohio; Dr. R. M. Hall, Cleveland, Ohio; Dr. Sidney S. Haniford, Buffalo, New York; Dr. Harold S. Harris, Bellflower, California; Dr. Clyde J. Hathaway, Pontiac, Michigan; Dr. F. M. Hathaway, Pontiac, Michigan; Dr. John A. Hattstrom, Evanston, Illinois.

Dr. George Haus, Memphis, Tennessee; Dr. Norman B. Hays, Niagara Falls, New York; Dr. T. R. Hedges, Sandusky, Ohio; Dr. Wayne Helmbrecht, Warren, Pennsylvania; Dr. H. B. Hewett, Lake Charles, Louisiana; Dr. E. L. Higgins, Cleveland, Ohio; Dr. Monroe J. Hirsch, Los Angeles, California; Dr. H. W. Hofstetter, Los Angeles, California; Dr. T. E. Holleman, Winston-Salem, North Carolina; Dr. John R. Hubbard, Cleveland, Ohio; Dr. D. G. Hummel, Cleveland, Ohio; Dr. F. A. Humphrey, Elyria, Ohio; Dr. E. A. Hutchinson, Los Angeles, California; Dr. Aaron Hyman, New York, New York.

Mr. Fred W. Job, Rochester, New York; Dr. Paul Johnston, Cleveland, Ohio; Dr. George F. Jones, Salem, Ohio; Dr. Isadore Kaplan, New York, New York; Dr. M. H. Kauhl, Cleveland, Ohio; Dr. George W. Keevil, Toronto, Ontario, Canada; Dr. John R. Kelly, Petoskey, Michigan; Dr. Roscoe J. Kennedy, Cleveland, Ohio; Mr. L. C. Kent and Mr. J. M. Ketch, General Electric Company, Cleveland, Ohio; Dr. James B. Kirk, Adrian, Michigan; Dr. Arthur S. Kitchen, Clearwater, Florida; Dr. H. A. Knoll, Columbus, Ohio; Dr. George W. Knox, Columbus, Ohio; Dr. Carel C. Koch, Minneapolis, Minnesota; Dr. J. Donald Kratz, Souderton, Pennsylvania.

Dr. Alfred Lit, New York, New York; Dr. Matthew Luckiesh, Cleveland, Ohio; Dr. Virgil A. McCleary, Warsaw, Indiana; Dr. O. L. McCulloch, Holyoke, Massachusetts; Dr. Leo F. Madigan, Boston, Massachusetts; Dr. Edwin H. Manwiller, Philadelphia, Pennsylvania; Dr. Russell S. Manwiller, Philadelphia, Pennsylvania; Dr. Roy Marks, New York, New York; Dr. Walter H. Matthews, Athens, Georgia; Dr. Bernard Mazow, Houston, Texas; Dr. John W. Mogey, Flushing, New York; Dr. Meredith W. Morgan, Berkeley, California; Dr. Herbert G. Mote, Columbus, Ohio; Dr. Richard A. Needles, Chicago, Illinois; Dr. J. C. Neill, Philadelphia, Pennsylvania; Dr. Julius Neumueller, Haddonfield, New Jersey; Dr. E. C. Nurock, Trenton, New Jersey; Mr. R. L. Oetting, General Electric Company, Cleveland, Ohio; Dr. Kenneth Ogle, Rochester, Minnesota.

Aileen Page, General Electric Company, Cleveland, Ohio; Dr. George A. Parkins, Ord, Nebraska; Dr. J. D. Perry, Jr., Winston-Salem, North Carolina; Dr. H. H. Peters, Cleveland, Ohio; Dr. William W. Policoff, Wilkes-Barre, Pennsylvania; Dr. Carl A. Radde, Cleveland, Ohio; Dr. D. R. Reed, La Porte, Indiana; Dr. E. E. Reese, Westerville, Ohio; Dr. Thomas H. Riley, Fairport Harbor, Ohio; Dr. Nathan A. Robbins, Buffalo, New York; Dr. Helen M. Robinson, Chicago, Illinois; Dr. Kenneth G. Robinson, Medina, Ohio; Mr. Alston Rodgers, General Electric Company, Cleveland, Ohio; Dr. John Rose, Chardon, Ohio; Dr. J. C. Russel, Brunswick, Maine; Dr. Onofrey G. Rybachok, Philadelphia, Pennsylvania.

Dr. Herman Sager, Long Island, New York; Dr. John R. Schafer, Statesville, North Carolina; Dr. Charles Schiffman, Waterbury, Connecticut; Dr. Arthur A. Schmidt, Cleveland, Ohio; Dr. O. A. Schuessler, Cincinnati, Ohio; Dr. William P. Schumann, Vineland, New Jersey; Dr. Charles Sheard, Rochester, Minnesota; Dr. J. G. Shelton, Austin, Texas; Dr. William A. Sherard, Columbus, Ohio; Dr. Frieda E. Shute, Middlesfield, Ohio; Dr. Edwin H. Silver, Washington, D. C.; Dr. Harold Simmerman, Woodbury, New Jersey; Dr. William B. Simukka, Chicago, Illinois; Dr. Donald D. Slater, Hot Springs, South Dakota; Dr. S. Winfield Smith, Wilmington, Delaware; Dr. Martin R. Snook, Newton, New Jersey; Dr. Donald A. Springer, Anniston, Alabama; Dr. Charles Stewart, Columbus, Ohio; Dr. Kenneth B. Stoddard, Berkeley, California; Dr. Eugene Strawn, Freeport, Illinois.

Dr. T. F. Taylor, Ottawa, Illinois; Dr. David C. Thomson, Detroit, Michigan; Dr. R. W. Tubesing, Richmond, Indiana; Dr. Charles Turner, Cleveland, Ohio; Dr. Irving I. Vics, Albany, New York; Dr. William O. Vivian, Media, Pennsylvania; Dr. David Volk, Columbus, Ohio; Dr. R. N. Walker, Winston-Salem, North Carolina; Dr. William G. Walton, Jr., Merion, Pennsylvania; Dr. J. Maurice Wareham, Mt. Vernon, Ohio; Dr. M. Weitzenhof, Cleveland, Ohio; Dr. Irving Weiss, New Britain,

Connecticut; Dr. S. G. Weiss, Torrington, Connecticut; Dr. Robert D. Welsh, Columbus, Ohio; Dr. John J. Wey, Painesville, Ohio; Dr. Joseph A. Wey, Painesville, Ohio. Dr. Arthur P. Wheelock, Des Moines, Iowa; Dr. R. E. White, Toronto, Ontario, Canada; Dr. Ralph E. Wick, Rapid City, South Dakota; Dr. P. A. Wilkinson, Wellington, Ohio; Dr. M. S. Willis, Elyria, Ohio; Dr. E. Craig Wilson, Rutland, Vermont; Dr. A. H. Wittlig, Cleveland, Ohio; Dr. John Zettel, Jr., Cincinnati, Ohio.

NEW MEMBERS OF THE ACADEMY

The following optometrists and educators received their final approval for membership during the last quarter of 1949. The Academy welcomes these new members.

Dr. Louis Anapolle, 73 Tremont Street, Boston, Massachusetts.
Dr. Irving Baker, 1454 Yonge Street, Toronto, Ontario, Canada.
Dr. Robert John Bray, 367 The Arcade, Cleveland, Ohio
Dr. William L. Cheatham, Jr., 547 Kress Building, Houston, Texas.
Lt. Charles Clinton Dunn, Air Force Hospital, MacDill AFB, Tampa, Florida.
Dr. Ralph B. Gaeta, 147 East Main Street, Ramsey, New Jersey.
Dr. E. J. Gording, 1015 Graham Avenue, Windber, Pennsylvania.
Dr. Howard F. Haines, 74 South Third Street, Columbus, Ohio.
Dr. H. B. Hewett, 833 Hodges Street, Lake Charles, Louisiana.
Dr. J. K. Hirokawa, Hawaii Building, Honolulu, Hawaii.
Dr. Elwin Marg, School of Optometry, University of California, Berkeley, California.
Dr. Walker H. Matthews, 130 West Hancock Street, Athens, Georgia.
Dr. A. J. Rose, 227 Main Street, Chardon, Ohio.
Dr. Bernard Rosett, School of Optometry, Columbia University, New York, New York.
Dr. Herman Sager, Eye Clinic, Sperry Gyroscope Company, Lake Success, New York.
Dr. Charles Schiffman, 65 Bank Street, Waterbury, Connecticut.
Dr. T. Fenwick Taylor, 621½ LaSalle Street, Ottawa, Illinois.
Dr. Robert E. Welsh, 79 East State Street, Columbus, Ohio.

PRESIDENT'S ANNUAL REPORT

Daniel G. Humel†

At the last meeting in Winston-Salem, the Executive Council, realizing that the affairs of the Academy had increased enormously, decided to add some of the key chairmen of committees as ex-officio

†Optometrist. Fellow, American Academy of Optometry.

members of the council. The closer contact of these chairmen to the Executive Council has resulted in much greater efficiency in the conduct of Academy business.

The Academy is proud of its record based on its achievements and equally proud of the professional standing of its Fellows. With the recent rapid growth of our organization it would be well to pause and remind ourselves that office location and professional appearance, while of the utmost importance, are secondary to the professional standing of the practitioner with his colleagues, other professional practitioners and his community. Indoctrination of the individual in Academy principles should begin before application for membership.

All optometry and specifically the American Academy can well be proud of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF THE AMERICAN ACADEMY OF OPTOMETRY. Its standard as a scientific publication has been well illustrated, this past year, by numerous references in other scientific publications to articles first appearing in it. Notable among these other publications are the QUARTERLY REVIEW OF OPHTHALMOLOGY AND ALLIED SCIENCES published by the Washington Institute of Medicine, EXCERPTA MEDICA of Holland and Borish's CLINICAL REFRACTION.

To maintain and increase the standards of the AMERICAN JOURNAL OF OPTOMETRY the Fellows of the American Academy are urged to give preference to the Journal in the publication of their scientific investigations.

Dr. Monroe Hirsch, in recent years, has been instrumental in urging membership for the Academy in the American Association for the Advancement of Science. Dr. Henry Hofstetter has further helped. In the past year Dr. Harold Fisher has completed this work. It is to the credit of the Academy that they were graciously accepted. Membership in the A. A. A. S. is desirable. Those in the Academy who are eligible for Fellowship in this organization are urged to make application.

The Executive Council has been fortunate in its selection of chairmen and committeemen. We would like to call your attention to some of those who have done outstanding work. Dr. Robert E. Bannon has arranged what is probably our best program of all time. His help to various speakers in the technical arrangements of their papers is in itself an exceptional contribution. Drs. J. Donald Kratz, Harold Fisher, John C. Neill and William O. Vivian as chairmen of the four sections have arranged excellent practical educational programs.

We extend to the General Electric Company through Fellows Dr. Matthew Luckiesh and Mr. Sylvester Guth our appreciation for the

program they have arranged.

Dr. Arthur P. Wheelock as the guiding force of the committee on admittance and with his committee to revise the Manual of Instruction has placed the work of admittance to Fellowship on a sound basis. Credit is due also to the previous committee on admittance for their contributions.

The Editorial Committee, as now constituted, has extended its work. Dr. J. Fred Andreae continues to serve the Academy as chairman of this important committee.

Dr. Harold Fisher has been mentioned previously. In addition it can be said that as chairman of the advisory committee he has been of great help to the present administration.

In conclusion, I would like to extend my appreciation to all committee chairmen and their committeemen and to every member of the Executive Council for their contributions. Especially is it appropriate to say that your secretary, Dr. Carel C. Koch, continues to give to the Academy time and energy far in excess of the requirements of his position.

SECRETARY-TREASURER'S ANNUAL REPORT

Carel C. Koch†
Minneapolis, Minnesota

This Secretary-Treasurer's report covers the period December 1, 1948 to November 30, 1949. As usual, I can report progress to the membership.

A new chapter has been organized in the Northwestern part of the country. This active group is called the Northwest-Pacific Chapter.

During this period, 41 applicants were approved by the committee on admittance and the Executive Council and we welcome these new members. During this same time, 62 new applications were screened and passed on to the committee on admittance for future action and processing. The regional committees on admittance are working very well and as usual, our chapters have been of assistance to the committee on admittance and to us all.

During the year a new Manual of Instructions for Applicants has been published and distributed widely to applicants and others who are interested. A new roster containing the newly amended constitution and by-laws has been distributed to all members and applicants.

A number of our chapters have held outstanding educational meet-

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ings during the period and from these come forward looking reports for 1950.

As secretary, I am pleased to report no membership losses by death since my last report to the Academy at Winston-Salem. During this period, we have dropped one member for unprofessional conduct, and three members for dues delinquency. I also regret to report the resignations of Dr. J. J. Curren of Ossining, New York, Dr. J. F. Hahn of New York City, and Dr. H. A. Nott of Winnipeg, Canada.

During this period we of the Academy have, through the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY published a number of original scientific papers dealing with visual care. As this publication is widely read from coast to coast the technical material assembled by the Academy influences a country-wide optometric audience. Our readership is now past the six thousand mark.

This is the 28th general meeting of the Academy. The program this year is outstanding. Credit should go to Dr. Robert E. Bannon and his Papers and Program Committee, as well as to the four section chairmen: Dr. John C. Neill, contact lenses; Dr. Harold Fisher, aniseikonia; Dr. J. D. Kratz, orthoptics; and Dr. W. O. Vivian, pathology.

The Academy now numbers more than 500 active members. It is a growing and vital force in optometry for the advancing high standards of optometric practice. Its fine work, however, can be further augmented by additional members, and in view of growing demands upon the Academy for funds for grants-in-aid in visual research I suggest to the membership that they now propose the names of optometrists who meet the requirements for Fellowship to enable us to effectively carry out the work of the Academy.

The financial position of the Academy is sound as shown in the balance sheet mailed to all members, but the committee on research projects could use additional funds, and as these come from annual dues, it would be helpful to accelerate the intake of new members without reducing Academy standards in this regard.

My work as secretary-treasurer has been made easy and pleasant by the wholehearted support given this Academy office by President Hummel and the entire Executive Council. No group could give finer cooperation, and I am thankful to them for this. I also wish to thank the Academy standing committees who, too, have been most cooperative. I am also appreciative of the fine assistance we have had from the Journal staff, who in great part carry the work of the Academy office along with their regular duties.

RESEARCH PROJECTS COMMITTEE REPORT

Meredith W. Morgan†
Berkeley, California

In 1949, the research projects committee was not active, as the funds set aside for this year were assigned by last year's committee for a project which continues over several years. Recently, letters were sent to the schools inquiring whether grants-in-aid would be useful for 1950. At the present time your committee has before it requests in excess of $10,000.00.

Our financial capacity at the present time seems to be about $1,500.00 to $2,000.00 a year. This of course means that we must deny some of the requests. This will be unfortunate since each project which has been submitted to date is extremely valuable. The committee will have considerable difficulty in deciding which project to accept.

This great increase in projects has occurred in spite of the fact that this year three American Optometric Foundation Fellowships are being granted for the year 1950. It would thus appear that the spirit of scientific investigation has really taken hold of optometry. We now have capable men trained in research anxious to work. The only thing we lack is money. The research projects committee takes this opportunity to announce that the Academy will be happy to receive funds for the purpose of increasing the Academy grants-in-aid for research.

In order that you might be assured that any contributions you can give will be used for a worthy purpose, I will review briefly the work done in the past.

Since the inception of the research projects committee, the American Academy of Optometry has given financial support to some 15 projects. The Academy grants-in-aid have amounted to $11,750.00.

Seven of the projects have been investigations of fundamental processes in vision while eight have been investigations of clinical aspects. Thus there has been maintained through the years a rather nice balance between theoretical and applied optometry.

The men receiving aid in their work have been Drs. William Feinbloom, Robert Beitel, Jack Kurtz, Brant Clark, William Tait, Lewis Kraskin, Meredith Morgan, Robert Bannon, Charles Bridgman, Glenn Fry, Henry Knoll, Frederick Lit and Aaron Hyman.

All of the work has been performed at outstanding schools and colleges; namely, Columbia University, Clark University, University of

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†Chairman, Research Projects Committee, American Academy of Optometry. Optometrist. Fellow, American Academy of Optometry.

Minnesota, University of Southern California, Pennsylvania State College of Optometry, George Washington University, University of California, Dartmouth College, and Ohio State University.

A list of the separate projects is as follows:

Columbia University, Dr. William Feinbloom, Problem of Strabismus. $2,000.00.
Columbia University, Dr. William Feinbloom, Report of 500 Cases of Subnormal Vision. $500.00.
Clark University, Dr. Robert J. Beitel, Visual Threshold. $300.00.
University of Minnesota, Dr. J. I. Kurtz, Reliability of Near Point Accommodative Tests. $350.00.
Columbia University, Dr. William Feinbloom, Visual Rehabilitation. $200.00.
University of Southern California, Dr. Brant Clark, Binocular Behavior of Eyes—Photographic Study. $100.00.
Pennsylvania State College of Optometry, Dr. William J. Tait, Fusional Convergence Amplitude Study. $150.00.
George Washington University, Dr. Lewis H. Kraskin, Emotional Disorders and Their Effect on Vision. $150.00.
University of California, Dr. Meredith W. Morgan, Jr., Studies in Binocular Vision. $500.00.
Dartmouth College, Dr. Robert E. Bannon, Study of Cycloplegic Refraction. $1,000.00.
The Ohio State University, Drs. Glenn A. Fry and Charles S. Bridgman, Designing Tests for Color Blindness. $1,000.00.
University of California, Dr. Meredith W. Morgan, Jr., Accommodation-Convergence Relationship. $500.00.
The Ohio State University, Drs. Glenn A. Fry and Henry Knoll, An Investigation of the Low Levels of Illumination and Freedom of Optical Stimulation of Accommodation upon the Refractive State of the Eye. Part I. $1,500.00.
The Ohio State University, Drs. Glenn A. Fry and Henry Knoll, An Investigation of the Low Levels of Illumination and Freedom of Optical Stimulation of Accommodation upon the Refractive State of the Eye. Part II. $1,500.00.
Columbia University, Drs. Frederick Lit and Aaron Hyman, Study of the Pulfrich Phenomena. $2,000.00.

CURRENT COMMENTS

Virginia Huck
Editorial Assistant

Optometrists will confer a favor by sending news items of general interest for this department; such as relate to new instruments, clinical techniques, education, visual health and optometric legislation and organization.

A. O. A. GENERAL CONGRESS COMMITTEE APPOINTED

Dr. Roger Lindquist, Minneapolis, will serve as chairman of the General Congress Committee for the American Optometric Association annual Congress in Minneapolis, June 25-28, 1950. Dr. Lindquist's appointment was announced January 4 by the A. O. A. at Congress headquarters in Minneapolis.

A graduate of Columbia Optical College, St. Paul, Minnesota, Dr. Lindquist has practiced 22 years in Minneapolis, and during that time has become one of the Upper Midwest's most active optometric leaders. He is President of the Minnesota State Association of Optometrists, and

a member of their Board of Directors: Vice President of the Minnesota State Board of Examiners in Optometry, and a member of the Minneapolis District Optometric Society. Dr. Lindquist has also been active in civic affairs in Minneapolis.

Serving with Dr. Lindquist on the Congress General Committee are the following Minnesota optometrists:

Secretary, Congress General Committee, Dr. Carel C. Koch, Minneapolis, Minnesota.
Treasurer, Congress General Committee, Dr. Fred H. Rohlin, Marshall, Minnesota.
Congress Registration Committee, Dr. Lorne E. Holmes, Minneapolis, Minnesota, Chairman.
Education and Speakers Committee, Dr. Marvin R. Hallgren, Robbinsdale, Minnesota, Chairman.
Hotel Arrangements Committee, Dr. A. E. Tillish, Minneapolis, Minnesota, Chairman.
Transportation Committee, Dr. Leo A. Meyer, St. Paul, Minnesota, Chairman.
Entertainment Committee, Dr. L. L. Stillman, Minneapolis, Minnesota, Chairman.
Exhibits Committee, Dr. John Shimek, Minneapolis, Minnesota, Chairman.

All members of each committee will be announced at a later date. Congress headquarters office is 610 West Broadway, Minneapolis, Minnesota.

ANISEIKONIA PATENTS DEDICATED TO PUBLIC

Twenty-six patents issued to the Hanover Institute, Hanover, New Hampshire, during its investigations of the problems of binocular vision, especially aniseikonia, have been dedicated to the public, according to a recent bulletin from the Aniseikonia Forum. These patents were assigned to the people of the United States of America because, the bulletin states, "inasmuch as the Dartmouth Eye Institute fulfilled, so far as possible under the circumstances, its task of investigating, calling attention to, and initiating treatment of aniseikonia, it was believed to be in the public interest to dedicate the intellectual material in these patents to the public."

The subject matter of the patents is covered in the professional literature, but the patents contain much information not presented in the literature, such as data of detail construction, specific methods of testing, and psychophysiological background material.

A list of the patents covering methods and instruments is on file with Dr. Robert E. Bannon, secretary-treasurer of the Aniseikonic Forum, Columbia University, 433 West 123rd Street, New York 27, New York. Copies of the patents are available from the United States Patent Office at 25 cents each.

RESEARCH FELLOWSHIPS AWARDED BY FOUNDATION

Two research fellowships were awarded in December by the American Optometric Foundation to veterans of World War II. One of the

awards was made to Dr. Charles Reese Stewart, Columbus, Ohio; the other to Dr. Alfred A. Rosenbloom, Pittsburgh, Pennsylvania.

Dr. Stewart is at present enrolled in the department of Physiological Optics, Graduate School, The Ohio State University. He is investigating, photographically, the time characteristics of fusional divergence movements. From the photographic records he is obtaining (1) reaction time, (2) velocity of movements of different magnitude, and (3) a qualitative description of these fusional movements.

Dr. Rosenbloom received his Doctor of Optometry degree in May, 1948, from Northern Illinois College of Optometry, and has since served as a staff associate of Northern Illinois Eye Clinic. His research is in the realm of preventive optometry with special emphasis on reading problems. He intends to study and to establish norms for pre-reading and post-reading stage children and study the impairment imposed by near point work on the visual adjustment of the child.

According to Dr. William C. Ezell, president of the Foundation, a third award will be announced soon.

DATA ON LIGHTING IN SCHOOLS REQUIRED

A study committee on student vision and scholarship has been established by the Illuminating Engineering Society. Chairman of the committee is Mr. Sylvester K. Guth of the General Electric Company, Nela Park, Cleveland, Ohio.

Mr. Guth explains the purpose of the committee is to collect and evaluate statistics of student visual defects and the results of existing studies on student scholarship and illumination. The committee hopes its work will result in more definite information regarding the effects of prolonged critical seeing upon the prevalence of defective vision, and to what extent light and lighting can contribute to a reduction of defective vision.

At present, the committee is collecting statistics and asks that any group connected with conducting surveys of lighting in schools contact Mr. Guth.

NEW P. U. C. O. RECORD CHART

A new case study form is now available to the profession. Now in use at Pacific University College of Optometry, the form is similar in content, but different in format, from those commonly in use. Its size is 25½" x 11" and folds in thirds to fit standard 8½" x 11" files. Experimentation with the form at Pacific has proven, according to Dr. C. B. Margach, clinic director, that the card is more efficient for case

study, convenient for comparative case studies, and easier to work with because of ample space in which to record findings. Practitioners interested in ordering forms should write Pacific University Bookstore, Forest Grove, Oregon; those interested in studying a sample, may obtain one without charge from Dr. C. B. Margach, Clinic Director, Pacific University College of Optometry, Forest Grove, Oregon.

NEWS BRIEFS

Dr. Mathew Alpern, research fellow in physiological optics at The Ohio State University, was guest lecturer recently at the Los Angeles College of Optometry. Dr. Alpern spoke on "The Zone of Clear Single Binocular Vision at the Upper Levels of Accommodation and Convergence." . . . Soft Lite and Bay State Optical companies have joined selling forces to "be of greater service to distributors, refractionists, and the industry as a whole," according to a recent news release. . . . Southern College of Optometry conferred 93 Doctor of Optometry degrees at the December graduation exercises, the largest graduating class in the school's history. Dr. Emmett Day of Kaufman, Texas, delivered the commencement address. . . . The A. O. A.'s public relations program reached more than a million Americans a day during September and October, 1949, according to their Department of Public Information. . . . An extension course in interpretation and analysis of optometric clinical findings got under way January 18 at the University of California, with Dr. Henry W. Hofstetter, Los Angeles College of Optometry, and Dr. Meredith W. Morgan, Jr., of the University, instructing. The course includes 12 meetings in which case studies, clinical analysis of the accommodation-convergence relationship in terms of the fundamental variables, and correlation and analysis of data obtained in various optometric tests will be featured. . . . The American Optical Company opened a new research laboratory in Stanford, Connecticut, November 30. Studies in geometrical optics, microscopy, photographic optics, spectroscopy, glass chemistry, instruments and optical materials will be carried on at the new center. . . . Mr. Gerald F. Weis, formerly vice president in charge of manufacturing of Univis Lens Company, has been promoted to vice president and general manager of the company, according to an announcement by Mr. M. H. Stanley, company president. Mr. Weis takes the post left vacant by the recent resignation of Dr. Roy Marks. . . . A branch office of Solex Laboratories, Inc., manufacturers of the Tuohy Corneal Lens, has been opened in Chicago, to serve Midwestern accounts. Dr. Harold S. Harris has been appointed manager. . . . Mr. Freddy Lees, managing director of the London Office,

Soft-Lite Lens Company, Ltd., spent part of December and January in the United States, discussing the British Health Service plan and its effect on the optical industry, as well as sales and advertising development. It was Mr. Lees' first visit to the U. S. . . . New president of Bausch & Lomb Optical Company is Mr. Joseph F. Taylor, formerly vice president and treasurer. Mr. Taylor fills the vacancy created by the election of Mr. M. Herbert Eisenhart to chairman of the board of directors. Mr. Eisenhart has been president since 1935. . . . Attendance broke all previous records at the recent annual Northwest Congress in Portland. It is claimed, more than 800 optometrists and educators gathered to study visual problems. . . . Mr. J. E. Bohle will take over the presidency of Riggs Optical Company following the retirement of Mr. R. A. McCluskey, March 1, 1950. Mr. Bohle is currently vice president and treasurer of the firm.

SPECIAL REPORT

COMMENTS ON "THE PHILOSOPHY AND SCIENCE OF HEALTH" BY ROGERS*

Lawrence P. Folsom†
South Royalton, Vermont

One might well question why a book‡ upon "health" should be published by an optometric group and particularly why the author of such a work should have received the Gold Medal of The Distinguished Service Foundation of Optometry. The reader who recalls that the functional efficiency and health of the human visual mechanism rests upon that of the body of which it is a part will easily answer the first portion of his question; those who heard the address of Dr. M. Luckiesh at the last meeting of the Academy in Cleveland and his remarks concerning the customary resistance with which new forms of scientific thought have been met throughout all history will have an answer for

*Submitted on December 16, 1949 for publication in the January, 1950, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.

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‡The Philosophy and Science of Health. E. E. Rogers, M. C., C. M., Vancouver, B. C., Canada. Published by the Distinguished Service Foundation of Optometry, South Royalton, Vermont. 153 pages. Cloth. $5. 1949.

the last portion of their question, for the work of Dr. Rogers is "a new way of thinking."

It goes much deeper than surface effects; it goes to the fundamental principles which underlie the functional efficiency, physical health and structural normalities of the human individual as a whole, as well as that of his visual welfare. Optometrists for years have studied glaucoma, for instance, and traced its causes to such events as arteriosclerosis or cataract surgery. Iritis is often blamed upon dental infection, myopia upon heredity or environment and squint upon everything from whooping-cough to amblyopia. But what is the key factor of which the arteriosclerosis, cataract, abscessed teeth, myopia, squint, whooping-cough and amblyopia are in themselves but differing symptoms?

Contrary to the usual belief that illness and malfunction are "caught" from one's environment and that bacteria and other "bad things" are largely responsible for one's misfortunes the author illustrates why the correct approach to these human problems must admit the evidence that disease and faulty function or structure do not "strike" one from outside, that one is not "infected" with these troubles, but builds them within himself by his own habits. The author's analysis of the germ theory will prove irritating to those who strongly believe in "germs" but the study of the references mentioned is highly valuable.

Citing in considerable detail the factors of heredity, habits and environment, he indicates that habit is the dominant one. "The physiological mechanism by which we grow, see, hear, feel, smell, breathe, remember or emote is the mechanism of the conditioned reflex . . . . . The physician or optometrist will want to do everything he can to restore as much function as possible. It is poor treatment to apply a crutch or splint or a treatment and say that no more can be done without trying."

The chapter on "Habits" covers careful discussion of thinking, nutrition, exercise, breathing and emotional life. The book is not a "diet" but a survey of all health factors though the author concludes that nutritional habits are the most important single factor. "The standard of metabolism in the ordinary individual is on a par with what the functional capacity of an automobile would be if one used anything that looked or tasted good and poured it into the gas tank." The book devotes many pages to an analysis of food and feeding and emphasizes that the chemical measure of a food is not enough; its electrical potential or life-giving power must also be understood. Many recipes are included.

The book may anger some readers, will not appeal to the casual

student, but is commended only to those prepared to read and re-read slowly and thoughtfully. It is not intended that optometrists should practice dietetics or attempt to change the living habits of their patients, though the more thoughtful patients would no doubt welcome such a book for themselves. An understanding of the principles involved, however, should serve to clarify one's thinking on the cause and prevention of much ocular error and inefficiency. A handy reference index is included in the work.

A LISTING OF NEW TECHNICAL BOOKS RECEIVED

WITH OCCASIONAL BRIEF COMMENT BY THE STAFF

Complete reviews will be presented as space permits

INTRODUCTION TO THEORETICAL AND EXPERIMENTAL OPTICS. Joseph Valasek, Ph.D., Professor of Physics, University of Minnesota. Minneapolis. Published by John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, New York. x + 454 pages. Illustrated. Cloth. $8.50. 1949. *Covers the geometrical and physical optics of ophthalmic lenses, photography and similar fields.*

OPHTHALMIC MEDICINE. Janes Hamilton Doggart, M.A., M.D., F.R.C.S. Surgeon, Moorfields, Westminster and Central Eye Hospital. London. Published by The Blakiston Company, 1012 Walnut St., Philadelphia 5, Pennsylvania. x + 329 pages. 28 color plates. 87 illustrations. Cloth. $8. 1949. *Ophthalmology from the standpoint of medicine rather than surgery.*

THE EYE AND ITS DISEASES. Edited by Conrad Berens, M.D., F.A.C.S. Chapters and sections by 92 ophthalmologists. Second edition. Published by W. B. Saunders Company, West Washington Square, Philadelphia 5, Pennsylvania. xviii + 1092 pages. 8 color plates. 436 illustrations. Cloth. $16. 1949. *Might well be called a revised encyclopedia of the eye.*

THE PHILOSOPHY AND SCIENCE OF HEALTH. E. E. Rogers, M.D. Published by the Distinguished Service Foundation of Optometry, South Royalton, Vermont. 153 pages. Cloth. $5. 1949. *A non-optometric book dealing with the author's singular views on diet, exercise, etc., as these relate to general health.*